For the competent person

Installation and maintenance instructions

ecoTEC plus

VU
VUW

GB, IE

Vaillant

BEFORE PROCEEDING - ENSURE BOILER IS CORRECT FOR GAS GROUP SUPPLIED!

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1 Notes on the documentation

The following instructions are intended to guide you throughout the entire documentation. Further documents apply in combination with these installation and maintenance instructions.
We accept no liability for any damage caused by non-observance of these instructions.

Other applicable documents

➤ Follow all installation instructions for the various parts and components of the system without exception when installing the ecoTEC plus.

These installation instructions are enclosed with the various system components as well as additional components.

➤ Also observe all the operating instructions included with the system components.

1.1 Storing documents

➤ Pass these installation instructions and all other applicable documents and, if necessary, any required aids to the system operator.

The operator will store the instructions and aids so that they are available when required.

1.2 Symbols used

The symbols used in the text are explained below:

Symbol that denotes useful tips and information

➤ Symbol for a required action

1.3 Applicability of the instructions

These installation instructions are only valid for boilers with the following article numbers:

Boiler	Type designation	Article number	Gas Council Number
ecoTEC plus	612 (VU GB 126/5-5)	0010011677	41-044-60
ecoTEC plus	615 (VU GB 156/5-5)	0010011678	41-044-61
ecoTEC plus	618 (VU GB 186/5-5)	0010011679	41-044-62
ecoTEC plus	618 (VU GB 186/5-5) (LPG)	0010011680	41-044-66
ecoTEC plus	624 (VU GB 246/5-5)	0010011681	41-044-63
ecoTEC plus	630 (VU GB 306/5-5)	0010011682	41-044-64
ecoTEC plus	630 (VU GB 306/5-5) (LPG)	0010011683	41-044-67
ecoTEC plus	637 (VU GB 376/5-5)	0010011684	41-044-65
ecoTEC plus	824 (VUW GB 246/5-5)	0010011685	47-044-40
ecoTEC plus	831 (VUW GB 316/5-5)	0010011686	47-044-41
ecoTEC plus	831 (VUW GB 316/5-5) (LPG)	0010011687	47-044-46
ecoTEC plus	837 (VUW GB 376/5-5)	0010011688	47-044-42

1.1 Appliance types, article numbers and Gas Council Number

The article number of the boiler can be found on the identification plate.

1.4 Identification plate

The identification plate of the Vaillant ecoTEC plus is attached to the underside of the boiler in the factory.
The article number of the gas fired wall hung boiler can be found in the serial number. The seventh to sixteenth numbers constitute the article number.
The serial number can also be found on the lift out badge located behind the front flap at the bottom of the boiler.
The serial number can also be shown on the display of the boiler (→ **Operating instructions**).

1.5 CE label

CE

The CE label shows that the boilers comply with the basic requirements of the applicable directives as stated on the identification plate.

- Directive 2009/142/EEC of the Commission with amendments "Directive for Harmonisation of Legal Regulations of the Member States for Gas Cosumption Appliances" (Gas equipment directive)
- Directive 92/42/EEC of the Commission with amendments "Directive Concerning the Efficiency of New Hot Water Heating Boilers Fired by Liquid or Gaseous Fuels" (Efficiency directive)

- Directive 2006/95/EC of the Council with amendments "Directive Concerning Electrical Equipment for Use Within Specific Voltage Limits" (Low voltage directive)
- Directive 2004/108/EC of the Council with amendments "Directive Concerning Electromagnetic Compatibility"

The boilers comply with the type sample described in the EC Type Sample Test Approval.
PIN No. CE-0085CM320
The boilers comply with the following standards:
- EN 483
- EN 625
- EN 677
- EN 55014
- EN 60335-1
- EN 60335-2-102
- EN 61000-3-2
- EN 61000-3-3

1.6 Benchmark

Vaillant Ltd. supports the Benchmark Initiative.
You will find the Benchmark Logbook on the last pages of this instruction manual. It is very important that this document be filled out properly when installing, commissioning, and fully explained at hand over to the operator of the installation. Installers should point out also the service record section for completion following service calls to this appliance.
Vaillant Ltd. is a licensed member of the Benchmark Scheme which aims to improve the standards of installation and commissioning of domestic heating and hot water systems in the UK and to encourage regular servicing to optimize safety, efficiency and performance. Benchmark is managed and promoted by the Heating and Hot water Industry Council.
➤ For more information visit www. centralheating .co .uk

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

Vaillant supply a special self adhesive sticker on top of the boiler for use in entering the serial number details straight onto the commissioning checklist found in the last pages of this document.

1.7 Type overview

Appliance type ecoTEC plus	Designated country (designation in accordance with ISO 3166)	Approval category
612 (VU GB 126/5-5)	GB (Great Britain) IE (Ireland)	I_{2H}
615 (VU GB 156/5-5)	GB (Great Britain) IE (Ireland)	I_{2H}
618 (VU GB 186/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}
624 (VU GB 246/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}
630 (VU GB 306/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}
637 (VU GB 376/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}
824 (VUW GB 246/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}
831 (VUW GB 316/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}
837 (VUW GB 376/5-5)	GB (Great Britain) IE (Ireland)	II_{2H3P}

1.2 Type overview

2 Safety

2.1 Safety and warning information

➤ When installing the ecoTEC plus, take account of the general safety instructions and the warning notes that appear before all of the actions.

2.1.1 Classification of warnings

The warning notes are classified in accordance with the severity of the possible danger using the following warning signs and signal words:

Warning sign	Signal word	Explanation
	Danger!	Immediate danger to life or risk of severe personal injury
	Danger!	Risk of death from electric shock
	Warning.	Risk of minor personal injury
	Caution.	Risk of material or environmental damage

2.1 Classification of warnings

2.1.2 Structure of warnings

Warning signs are identified by an upper and lower separating line. and are laid out according to the following basic principle:

Signal word!
Type and source of danger!
Explanation of the type and source of danger
➤ Measures for averting the danger

2.2 Intended use

The Vaillant ecoTEC plus boilers are state-of-the-art units which have been constructed in accordance with recognised safety regulations. Nevertheless, there is still a risk of injury or death to the operator or others or of damage to the boiler and other property in the event of improper use or use for which it is not intended.
This boiler is not designed to be used by persons (including children) with limited mental and sensory capabilities or by persons who do not have enough experience and/or knowledge, unless they are supervised by a person who is responsible for their safety or they have been instructed by him/her about how to use the boiler.
Children must be supervised to ensure that they do not play with the boiler.
The boiler is intended as a heater for closed hot water/central heating installations and for hot water generation.
The use of the ecoTEC plus in vehicles, such as mobile homes and caravans, is not classed as intended use. Units that are not classed as vehicles are those that are installed in a fixed and permanent location and that do not have any wheels (fixed installation).
Any other use, or use beyond that specified, shall be considered as improper use. Any direct commercial or industrial use is also deemed to be improper.
The manufacturer or supplier is not liable for any damage resulting from such use. The user alone bears the risk.
Intended use includes the following:
- observance of accompanying operating, installation and maintenance instructions for Vaillant products as well as for other parts and components of the system
- installing and fitting the appliance in accordance with the boiler and system approval
- complying with all of the inspection and maintenance conditions listed in the instructions.

Caution.
Any improper use is forbidden.

2.3 Basic safety instructions

➤ Observe the following safety instructions at all times.

European installation directive
Installation and maintenance of the appliance should only be undertaken by a competent person (referred to in these instructions as "competent person" or "skilled trade company" and thereby indicating male and female persons) approved at the time by the Health and Safety executive and in accordance with the gas safety (installation and use) regulations 1998. The existing regulations, rules and guidelines must be observed when doing so. The competent person is also responsible for inspection, maintenance and repairs to the unit, as well as alterations to the gas volume setting.

Only IE: The installation must comply with the current Version of I.S.813 "Domestic Gas Installations" and the current Building Regulations.
The current ETCI Regulations for installing electrical equipment must also be observed.

Installation and settings
In the following cases, the boiler must be operated only with the front casing fitted and closed and with a completely mounted air/flue gas duct:
- starting up
- test purposes
- continuous operation,

Otherwise, under unfavourable operating conditions, injury, death or material damage may occur.
Exclusively for test purposes such as gas working pressure testing the boiler may be operated with the front casing removed for short durations ONLY but must have a completely mounted air/flue gas duct.

What to do if you smell gas
Installation errors, damage, manipulation, an unauthorised installation site or similar can cause gas to escape and result in a risk of poisoning and explosion. If there is a smell of gas in the building, proceed as follows:
- ➤ Avoid rooms that smell of gas.
- ➤ If possible, open doors and windows fully and ensure air is circulating.
- ➤ Avoid the use of naked flames (e.g. lighters, matches).
- ➤ Do not smoke.
- ➤ Do not use any electrical switches, plugs, doorbells, telephones or other communication systems in the building.
- ➤ Close the gas meter isolator device or the main isolator device.
- ➤ If possible, close the gas stop cock on the unit.
- ➤ Warn the occupants in the building by knocking or calling.
- ➤ Leave the building.
- ➤ If you can actually hear gas leaking, leave the building immediately and ensure that no third parties enter the building.
- ➤ Alert the police and fire brigade when you are outside the building.
- ➤ Use a telephone outside the building to inform the gas supply company or National Grid Transco 0800 111999.

What to do if you smell exhaust fumes
Installation errors, damage, manipulation, unauthorised installation sites or the like can cause flue gas to escape and result in a risk of poisoning. If there is a smell of exhaust fumes in the building, proceed as follows:
- ➤ If possible, open doors and windows fully and ensure adequate ventilation.
- ➤ Switch the boiler off.
- ➤ Check the flue gas route in the boiler and the flue gas pipes.

Material damage caused by corrosion
To prevent corrosion on the boiler and also on the air/flue gas duct, note the following:
- ➤ Do not use sprays, solvents, chlorinated cleaning agents, paint, adhesives or similar substances in the vicinity of the boiler.

Under unfavourable circumstances, these substances may cause corrosion.

Material damage due to improper use and/or unsuitable tools
The use of unsuitable tools or improper use thereof may cause damage, such as gas or water leaks.
- ➤ When tightening or loosening threaded connections, always use suitable open-end spanners, but do not use pipe wrenches, extensions, etc.

2.4 Important information regarding propane-fired boilers

Purging the liquid gas tank when installing the system:
- ➤ Before installing the boiler, make sure that the gas tank has been purged.

The liquid gas supplier is responsible for proper ventilation of the tank. Ignition problems can result if the tank is not purged properly.
- ➤ In such cases, first contact the person in charge of filling the tank.
- ➤ Also observe the information on conversion to liquid gas in (→ **section 10.11**) of this manual.

Using the correct gas group
Using the wrong gas group may cause a fault shutdown on the boiler. Furthermore, ignition and combustion noise may occur in the boiler.
- ➤ Only use propane gas G31.

Affix tank sticker
Affix the enclosed tank sticker (propane quality) to the tank where it will be clearly visible, or on then cylinder cabinet near the filler nozzle if possible.

2.5 General requirements

2.5.1 Related documents

To ensure the safe installation and continued satisfactory operation of your appliance, all works shall be carried out by a competent installer fully conversant with the required current and up to date, acts standards, laws and regulations relevant for this range of equipment at the time of installation. In addition any special requirements of Local Authorities, gas undertakings or insurers must be complied with. Installers shall carryout a full site risk assessment and put into place all necessary steps and procedures to comply with Health and safety at work act and ensure safety of themselves and others with regard to manual handling and working at height requirements.
Attention shall be paid to (but not restricted to) the following:

- Gas Safety (Installation and Use) regulations.
- All Building Regulations 2000 for England and Wales,(as amended).
- (Includes Approved Codes of Practice and Approved Documents for building regulations e.g. L1, L1A, L1B, L8.)
- The Building Standards, Scotland, and any requirements determined by the local authorities within.
- The current Version of I.S.813 „Domestic Gas Installations“ and the current Building Regulations for IE.
- The current ETCI Regulations for installing electrical equipment for IE.
- **BS 7671** Requirements for electrical installations. IEE Wiring Regulations
- The Electricity at Work Regulations.
- The Water supply (water fittings) regulations 1999.
- **BS 5854** Code of practice for flues and flue structures in buildings.
- **BS EN 12828** Design of water-based heating systems.
- **BS EN 806 parts 1 - 5**
- **BS 8558**
- **BS 6880** Code of practice for low temperature heating systems with outputs greater than 45 kW.
  Part 1 Fundamental and design considerations.
  Part 2 Selection of equipment.
  Part 3 Installation, commissioning and maintenance.
- **BS 6981** Installation of low pressure gas pipework of up to 35 mm in domestic premises.
- **BS 4814** Specification for: Expansion vessels using an internal diaphragm, for sealed hot water and heating systems.
- **BS 7074** Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems.
  Part 1 Code of practice for domestic heating and hot water.
  Part 2 Code of practice for low and medium temperature hot water systems.
- **BS 7593** Code of practice for treatment of water in domestic hot water central heating systems
- **BS EN 13831** Closed expansion vessels with built in diaphragm
- **BS EN 14336** Heating systems in buildings. Installation and commissioning of water based heating systems.
- **BS 5440** – 1 Installation of flues and ventilation for gas appliances of rated input not exceeding 70 kW*
- **BS 5440** – 2 Flueing and ventilation for gas appliances of rated input not exceeding 70 kW*
  * 1st 2nd and 3rd family gases.
- **BS EN 6798** Installation & maintenance of gas fired hot water boilers of rated input not exceeding 70 kW net

Institute of Gas Engineers Publications:

- **IGE/UP/1B** (Edition 2) Tightness testing and direct purging of small natural gas installations.
- **IGE/UP/ 7** (Edition 2) Gas in timber and light steel framed buildings.
- **I.S. 813** - Domestic Gas Installations - 2nd edition (Ireland)
- **BS 5482** - Part 1 Domestic butane and propane gas burning installations

2.5.2 Installation site

The location chosen for the boiler must permit the provision of a satisfactory flue termination. The location must also provide adequate space for servicing and air circulation around the boiler.
Before commencement of any works the installer should carry out a full risk assessment in accordance with Health and Safety executive regulations.
The boiler may be installed in any room, although particular attention is drawn to the requirements of BS 7671 (IEE Regulations), the electrical provisions of the Building Regulations (Scotland) and in IE the current edition of IS 813 and the current ETCI rules, in respect of the installation of a boiler in a room containing a bath or shower.
In case of installation of the boiler in an unusual location, special procedures may be necessary and BS 5546 and BS 6798 give detailed guidance on this aspect. The boiler must be mounted on a flat, vertical wall, which must be sufficiently robust to take the weight of the boiler.
The boiler may be installed on a combustible wall, subject to the requirements of the Local Authorities and Building Regulations. A compartment used to enclose the boiler must be designed and constructed specifically for this purpose. (An existing cupboard or compartment may be used provided that it is modified for the purpose). Details of essential features of cupboard/compartment design including airing cupboard installations are given in BS 6891. In IE the current edition of IS 813.

If the boiler is to be installed in an airing cupboard it is not required to separate the boiler with a non-combustible partition. However installation and servicing clearances must be maintained, and the boiler kept clear of any clothing.

Caution.
Risk of damage caused by aggressive vapours and dust.
Aggressive vapours and dust in the installation room may cause corrosion damage to the boiler and to the flue gas installation.
➤ Ensure that the boiler is room sealed if the air in the installation room contains aggressive vapours or dust.

➤ Observe the following when choosing the installation site and operating the boiler,
  – Do not install the boiler in rooms prone to frost.
  – Do not install the boiler in rooms in which the combustion air contains chemical substances, e.g. fluoride, chlorine, sulphur, dust, etc. (e.g. sprays, solvents, cleaning agents, paint, adhesives).
➤ Please ensure that the boiler is room sealed or in a separate installation room if
  – the combustion air supply contains the aforementioned substances,
  – you install the boiler in hairdresser salons, painter's or joiner's workshops, cleaning businesses or similar.
➤ Do not route the combustion air through an old oil furnace chimney, as this can also cause corrosion.

2.5.3 Gas supply

An existing gas meter should be checked to ensure that it is capable of passing the rate of gas supply required.
Installation pipes should be fitted in accordance with BS 6891, in IE in accordance with the current issue of IS 813.
Pipework from the meter to the boiler must be of an adequate size.
Do not use pipes of a smaller size than the boiler gas connection. The complete installation must be tested and purged in accordance with:
– IGE/UP /1B for systems up to 0.035 m^3 capacity
– for larger systems IGE/UP/1A and
– for LPG installations refer to BS 5482 - 1 or
– IGE/UP1 Edition 2 for larger volume installations.

2.5.4 Air supply

Detailed recommendations for air supply are given in BS 5440: Part 2. It is not necessary to have an air vent in the room or internal space in which the boiler is installed.

2.5.5 Compartment ventilation

The boilers are very high efficiency appliances. As a consequence the heat loss from the appliance casing during operation is very low. Compartment ventilation is required if the flue used is not concentric and air is supplied from the room or compartment the boiler is installed in.

2.5.6 Electrical supply

Danger!
Risk of death from electric shock.
If the appliance is not earthed, it may hold voltage if a defect occurs.
➤ Earth the appliance.

A 230 V, ~ 50 Hz single phase electricity supply fused to 3 Amp. must be provided in accordance with the latest edition of BS 7671 (IEE Wiring Regulations) and any other local regulations that may apply. In IE reference should be made to the current edition of the ETCI rules. The method of connection to the mains electricity supply must provide a means of completely isolating the boiler and its ancillary controllers. Isolation is preferably by the use of a fused three pin plug and unswitched shuttered socket outlet, both complying with the requirements of BS 1363. Alternatively, a 3 Amp. fused doublepole switch with a 3 mm contact opening on both poles may be used.

2.5.7 Water supply Combination boilers

Designers and installers must ensure that all pipe work and fittings connected to the ecoTEC complies with the necessary water fittings regulations. See related documents above (ref BS 6700 and new BSEN 806 parts 1 - 5 plus BS 8558) For combination boilers the incoming water supply should be checked to ensure that sufficient pressure and flow rate are available to suite the intended use, see the technical data at the back of this manual.
All mains water heated by the ecoTEC combination boiler will be classed as Category 2 fluid and small expansion volumes created during warm up must be allowed to flow back into the supply pipe. No back flow prevention is necessary with this appliance as the very small expansion volume is unlikely to heat the incoming service pipe above 25 Deg C.
Note that where back flow prevention devices are fitted (this may include water meters) these can prevent the permitted expansion into the cold supply. This along with the effects of pumping and / or water hammer can result in a pressure build-up that may cause damage to the boiler (and other household devices such as showers). Vaillant cannot accept responsibility for damage caused to the boiler or its surroundings where an appliance has been fitted to supplies with mechanical back flow prevention. In these cases the requirement would be that a competent installer correctly installs a suitable shock arrestor / mini-expansion vessel adjacent to the boiler in the cold water supply pipe.

2.5.8 Water circulation system

Detailed recommendations concerning the water circuit system can be taken from BS 6798 and BS 5449, Part 1 (for

"Small Bore" and "Micro Bore" central heating installations). Lines which do not form part of the usable heating surface should be insulated to prevent heat losses and possible freezing up, especially where the lines run under rooves and ventilated cellar rooms. The drain connections must be easily-accessible, so that the entire system including the boiler and hot water system can be drained. The drain connections should be at least 1/2 " (BSP nominal size) and must be in accordance with BS 2879.
The boiler is suitable for Minibore and Microbore systems. Water lines are to be copper pipes in accordance with BS 2871, Part 1. These must be thoroughly cleaned, especially when connecting a new boiler to an existing system.

Risk of damage if the heating water is treated with unsuitable frost or corrosion protection agents.
Frost and corrosion protection agents can cause changes to seals, noise during heating mode and may lead to other consequential damage.
➤ Do not use any unsuitable frost or corrosion protection agents.

Mixing additives with the heating water can result in material damage. However no incompatibility with Vaillant boilers has been detected with proper use of the following products over a long period.
➤ When using additives, follow the manufacturer's instructions without exception.
Vaillant accepts no liability for the compatibility of any additive or its effectiveness in the rest of the heating installation.

Additives for cleaning measures (subsequent flushing required)
- Fernox F3
- Sentinel X 300
- Sentinel X 400

Additives intended to remain permanently in the system
- Fernox F1
- Fernox F2
- Sentinel X 100
- Sentinel X 200

Additives for frost protection intended to remain permanently in the system
- Fernox Antifreeze Alphi 11
- Sentinel X 500

➤ Inform the operator of the necessary measures if you have used these additives.
➤ Inform the operator about the required measures for frost protection.

Permissible water hardness
➤ Observe all valid national and technical regulations when conditioning filling and supplementary water.

Provided the national regulations and technical standards do not stipulate more stringent requirements, the following applies:
➤ You must condition the heating water in the following cases:
  - If the entire filling and supplementary water quantity during the operating life of the system exceeds three times the nominal volume of the heating installation or
  - If the limit values shown in the tables are not observed.

Total heating output	Overall hardness at smallest boiler heating surface[2]		
	20 l/kW	> 20 l/kW < 50 l/kW	> 50 l/kW
kW	mol/m³ (mg/l $CaCO_3$)	mol/m³ (mg/l $CaCO_3$)	mol/m³ (mg/l $CaCO_3$)
< 50	No requirement or < 3[1] < (300)[1]	2 (200)	0.02 (2.0)
> 50 to ≤ 200	2 (200)	1.5 (150)	0.02 (2.0)
>200 to ≤ 600	1.5 (150)	0.02 (2.0)	0.02 (2.0)
> 600	0.02 (2.0)	0.02 (2.0)	0.02 (2.0)

1) on systems with circulation water heaters and for systems with electric heating elements
2) from the specific system volume (nominal capacity in litres/heating output; for multiple boiler systems, the lowest individual heating output should be used). This data only applies up to 3 times the system volume for filling and top-up water. If 3 times the system volume figure is exceeded, the water must be treated in exactly the same way as if the limits quoted in table 2.2 were exceeded (softening, desalination, hardness stabilisation or desludging).

2.2 Guideline values for heating water: water hardness

2.5.9 Pressure relief valve

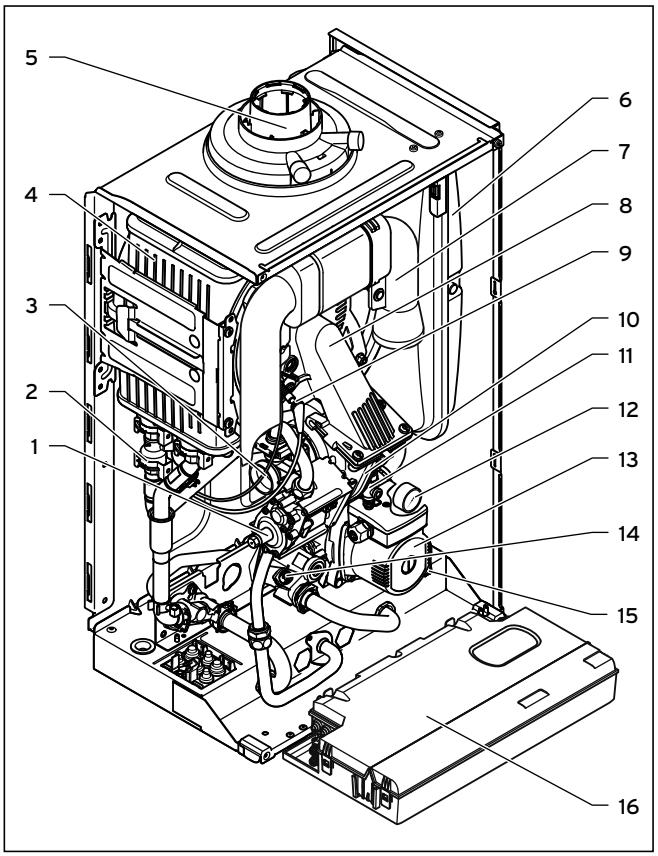
The boiler is equipped with a pressure relief valve. This safety device is required for all sealed central heating systems, is preset to 3 bar and is fitted with a 15 mm compression connection for the discharge pipe, whose diameter must not be less than 15 mm. The pressure relief valve must not be used for draining purposes.
For situations where the discharge cannot be easily routed Vaillant have a remote pressure relief valve mounting kit available which can be used to provide a suitable way to achieve this.

2.5.10 Venting

The boiler is fitted with an automatic air vent. Other measures need to be taken to allow the heating system to be either automatically or manually vented during filling and during commissioning.

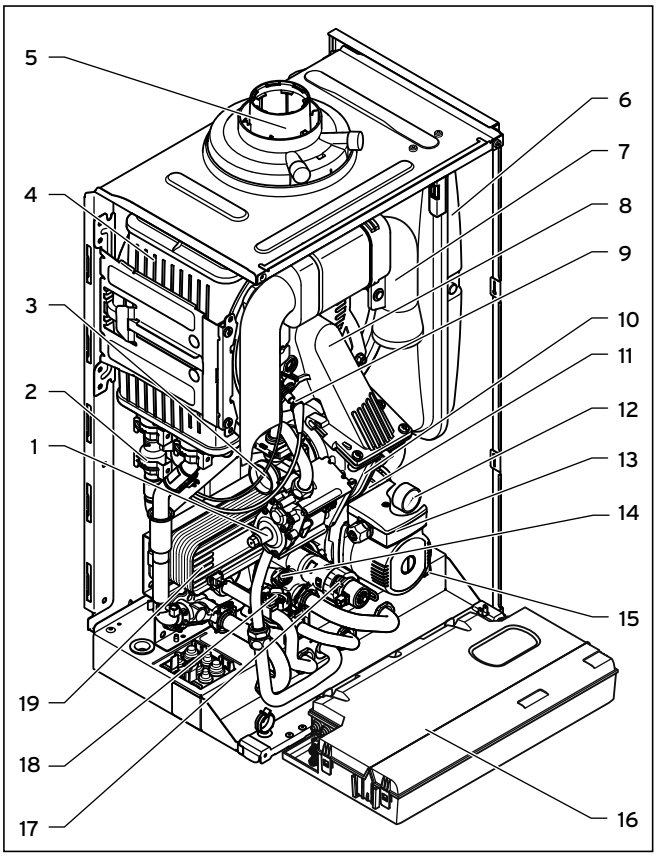
3 Description of the appliance

Design



3.1 Functional elements of the VU system boiler

Key
1 Gas valve
2 Water pressure sensor
3 Venturi with mass flow sensor
4 Heat exchanger
5 Connection for the air/flue gas duct
6 Expansion vessel
7 Air intake pipe
8 Compact thermal module
9 Ignition electrode
10 Fan
11 Automatic air vent
12 Pressure gauge
13 Internal pump
14 By-pass valve
15 Expansion relief valve
16 Electronics box



3.2 Functional elements of the VUW combination boiler

Key
1 Gas valve
2 Water pressure sensor
3 Venturi with mass flow sensor
4 Heat exchanger
5 Connection for the air/flue gas duct
6 Expansion vessel
7 Air intake pipe
8 Compact thermal module
9 Ignition electrode
10 Fan
11 Automatic air vent
12 Pressure gauge
13 Internal pump
14 By-pass valve
15 Expansion relief valve
16 Electronics box
17 Diverter valve with bypass
18 Impeller sensor (hot water)
19 Secondary heat exchanger

4 Installation

BEFORE PROCEEDING - ENSURE BOILER IS CORRECT FOR GAS GROUP SUPPLIED!

The work described in this section must only be carried out by a competent person.

4.1 Accessories

4.1.1 Controller

To control the ecoTEC, Vaillant offers various controller versions for connecting to the switching rail or for plugging into the operator control screen.

Room Thermostats
VRT 30 – Room Thermostat (230 V)
VRT 50 – Room Thermostat eBUS
Timers / Programmers
timeSWITCH 150 – mechanical clock
timeSWITCH 160 – 7 day programmer
Digital Room Temperature Controls
VRT 350 – Programmable Room Control
VRT 392f – RF Programmable Room Control *
VRT 350f – RF Programmable Room Control
Weather Compensating Controls
VRC 470 – Weather Compensator
VRC 470f – RF Weather Compensator
Communication
vrnetDIALOG
comDIALOG
Accessories
VR 65 – Control Centre
VR 66 – Control Centre
VR 61/2 – Two Zone Wiring Centre
VR 81/2 – Remote Control Unit
VR 68/2 – Solar Module

4.1 Controller accessories

* Note 392f RF transmitter wired external to boiler

4.1.2 Installation and operation

Optional accessories are available for use in conjunction with the installation and operation of the ecoTEC.

The current price list shows the complete range of hydraulic accessories for the ecoTEC plus series.

The pipes can be routed upwards behind the boiler in front of the wall (surface installation) using the spacer frame. Which means the distance between the wall and the boiler increases by 65 mm.

4.2 Scope of delivery

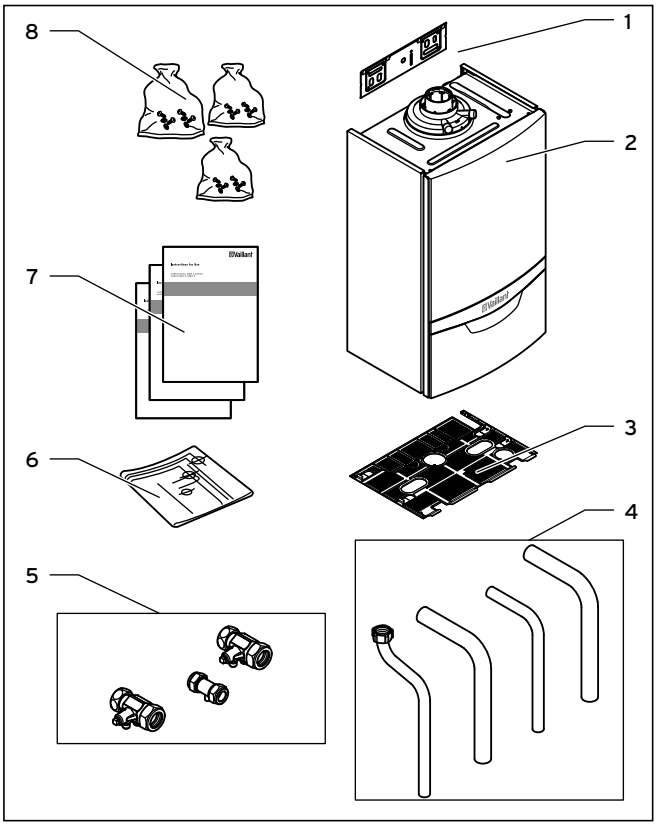
The Vaillant ecoTEC plus is delivered pre-mounted in a packaging unit.

4.2.1 Unpacking the boiler

- ➤ Remove the boiler from its box.
- ➤ Remove the protective film from all parts of the boiler.

4.2.2 Checking the scope of delivery.

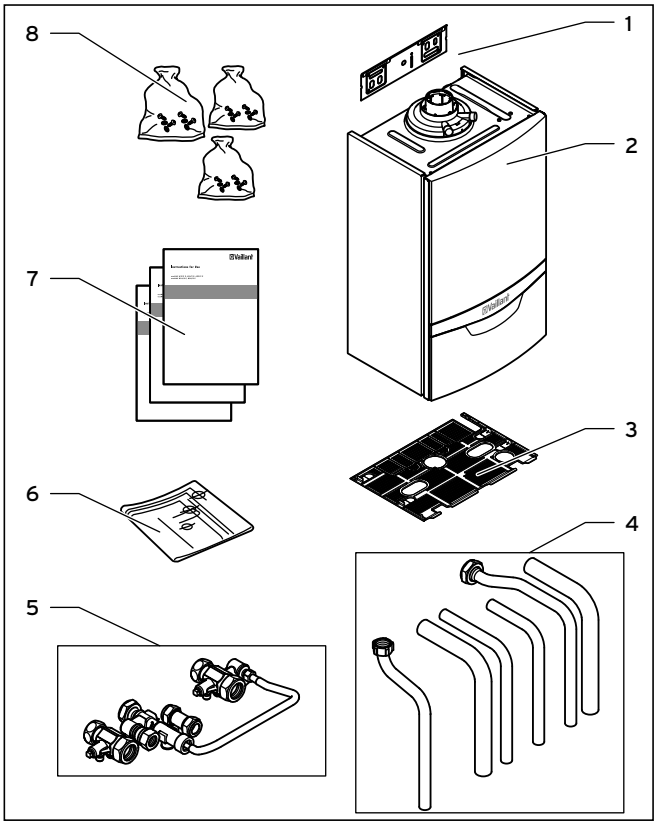
- ➤ Check that all parts have been delivered and are intact (→ **fig. 4.1** and → **table 4.2** or → **fig. 4.2** and → **table 4.3**).



4.1 Scope of delivery for ecoTEC plus VU boiler

Item	Qty	Description
1	1	Wall bracket
2	1	Boiler
3	1	Lower cover
4	4	Supply pipes (gas, heating, expansion relief valve)
5	3	Service valves
6	1	Installation template
7	1	Enclosure documentation
8	3	Bags with parts incl. electrical plug and cable clamps
	1	Additional for propane boilers: sticker for tank

4.2 Scope of delivery for ecoTEC plus VU boiler



4.2 Scope of delivery for ecoTEC plus VUW boiler

Item	Qty	Description
1	1	Wall bracket
2	1	Boiler
3	1	Lower cover
4	6	Supply pipes (gas, heating, water, expansion relief valve)
5	4	Service valves
6	1	Installation template
7	1	Enclosure documentation
8	3	Bags with parts incl. electrical plug and cable clamps
	1	Additional for propane boilers: sticker for tank

4.3 Scope of delivery for ecoTEC plus VUW boiler

4.2.3 Disposing of the packaging

- Dispose of the cardboard packaging used on the ecoTEC plus at a cardboard recycling site.
- Dispose of the plastic film and plastic filling at an appropriate plastic recycling site.
- Observe national regulations.

4.3 Transporting the appliance

Important:
With regards to the Manual Handling Operations, 1992 Regulations, the following lift operation exceeds the recommended weight for a one man lift.

General recommendations when handling
- Clear the route before attempting the lift.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Keep load as close to body as possible. Do not twist – reposition feet instead.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip.
- Always use assistance if required.

Removal of carton from delivery van
Recommend 2 person lift or 1 person with use of sack truck.
- If 1 person is performing lift, straddle the load, tilt and place carton into position on truck.
- Recommend secure appliance onto truck with suitable straps.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Keep load as close to body as possible.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Always use assistance if required.

Carriage of carton from point of delivery to point of installation – ground floor.
Recommend 2 person lift or 1 person with use of sack truck.
- If 1 person is performing lift, straddle the load, tilt and place carton into position on truck.
- Recommend secure appliance onto truck with suitable straps.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Keep load as close to body as possible.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Clear the route before attempting the lift.

- If removing boiler from truck straddle the load and tilt forwards to facilitate secure grip.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Do not twist – reposition feet instead.
- Take care to avoid trip hazards, slippery or wet surfaces and climbing steps and stairs.
- Always use assistance if required.

Carriage of carton from point of delivery to point of installation – first or higher floor, cellar.

Recommend 2-person lift or 1 person with use of sack truck.

- If 1 person is performing lift, straddle the load, tilt and place carton into position on truck.
- Recommend secure appliance onto truck with suitable straps.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Keep load as close to body as possible.
- If 2 persons performing lift, ensure co-ordinated movements during lift.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Clear the route before attempting the lift.
- If removing boiler from truck straddle the load and tilt forwards to facilitate secure grip.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Do not twist – reposition feet instead.
- Take care to avoid trip hazards, slippery or wet surfaces and climbing steps and stairs.
- Always use assistance if required.

Carriage of carton from point of delivery to point of installation – roofspace.

- Recommend 2-person lift.
- Ensure co-ordinated movements during lift.
- Avoid upper body/top heavy bending - do not lean forward/sideways.
- Clear the route before attempting the lift.
- Take care to avoid trip hazards, slippery or wet surfaces and climbing steps and stairs.
- When transferring appliance into roofspace, recommend 1 person to be in roofspace to receive the appliance and other person to be below to pass up and support appliance.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Keep load as close to body as possible.
- Always use assistance if required.
- It is assumed safe access, flooring and adequate lighting are provided in the roof space.
- It is recommended a risk assessment of the roof space area be carried out before moving the appliance into the area to take into account access, stability of flooring, lighting and other factors, and appropriate measures taken.

Unpacking of appliance from carton.

- Recommend 2 persons unpack appliance from carton.
- Always keep working area clear.
- Recommend straps and open carton flaps, then remove items from the top including the polystyrene packing and remove carton by sliding up over the boiler.
- Ensure safe lifting techniques are used – keep back straight – bend using legs.
- Keep load as close to body as possible.
- Always use assistance if required.
- Dispose of packaging in a responsible manner.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance outside packaging.

Positioning of Appliance for Final Installation – no obstructions.

- If appliance weight is over 25 kg always use 2 persons to move where practical.
- Fit bracket securely onto wall before lifting appliance into position.
- Obtain firm grip on front and sides of appliance, lift upwards, ensure stable balance achieved and lift upwards to position in place on bracket.
- Ensure safe lifting techniques are used – keep back straight – bend using legs - when lifting load from floor level.
- Do not twist – reposition feet instead.
- Keep boiler as close as possible to body throughout lift to minimise strain on back.
- Ensure co-ordinated movements to ensure equal spread of weight of load.
- Always use assistance if required.
- Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.

Positioning of Appliance for Final Installation – above worktop, foreseeable obstructions etc.

- If appliance weight is over 25 kg always use 2 persons to move where practical.
- Fit bracket securely onto wall before lifting appliance into position.
- Obtain firm grip on front and sides of appliance, lift upwards, onto worktop if practicable.
- Ensure stable balance achieved and lift upwards to position in place on bracket.
- If 2 persons positioning onto bracket obtain firm grip at front and sides/base of boiler.
- Ensure coordinated movements during 2 person lifts to ensure equal spread of weight of load.
- Ensure safe lifting techniques are used – keep back straight – bend using legs - when lifting load from floor level.
- Do not twist – reposition feet instead.
- Keep boiler as close as possible to body throughout lift to minimise strain on back.
- Avoid upper body/top heavy bending - do not lean forward/sideways.

- ➤ Always use assistance if required.
- ➤ Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.

Positioning of Appliance for Final Installation – within compartment etc. restricting installation.

- ➤ If appliance weight is over 25 kg always use 2 persons to move where practical.
- ➤ Fit bracket securely onto wall before lifting appliance into position.
- ➤ Obtain firm grip on front and sides of appliance, lift upwards, onto worktop if practicable.
- ➤ Ensure stable balance achieved and lift upwards to drop into place onto bracket.
- ➤ If 2 persons positioning onto bracket obtain firm grip at front and sides/base of boiler.
- ➤ Ensure coordinated movements during 2 person lifts to ensure equal spread of weight of load.
- ➤ If 1 person positioning onto bracket recommend obtain firm grip supporting base of boiler.
- ➤ Ensure safe lifting techniques are used – keep back straight – bend using legs - when lifting load from floor level.
- ➤ Do not twist – reposition feet instead.
- ➤ Keep boiler as close as possible to body throughout lift to minimise strain on back.
- ➤ Always use assistance if required.
- ➤ Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.

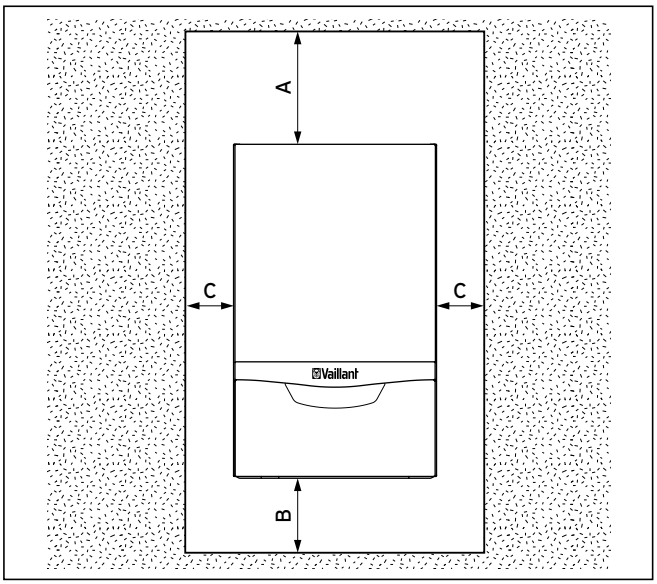
Positioning of Appliance for Final Installation – in roof space restricting installation.

- ➤ If appliance weight is over 25 kg always use 2 persons to move where practical.
- ➤ Obtain firm grip on front and sides of appliance, lift upwards, ensure stable balance achieved and lift upwards to drop into place onto bracket.
- ➤ If 2 persons positioning onto bracket obtain firm grip at front and sides/base of boiler.
- ➤ Ensure co-ordinated movements during 2 person lifts to ensure equal spread of weight of load.
- ➤ If 1 person positioning onto bracket recommend obtain firm grip supporting base of boiler.
- ➤ Ensure safe lifting techniques are used - keep back straight – bend using legs - when lifting load from floor level.
- ➤ Do not twist – reposition feet instead.
- ➤ Keep boiler as close as possible to body throughout lift to minimise strain on back.
- ➤ Always use assistance if required.
- ➤ Recommend wear suitable cut resistant gloves with good grip to protect against sharp edges and ensure good grip when handling appliance.
- ➤ It is recommended a risk assessment of the roof space area be carried out before moving the appliance into the area to take into account access, stability of flooring, lighting and other factors, and appropriate measures taken.

4.4 Requirements for the installation site

4.4.1 Required minimum clearances/installation clearances

- ➤ When using accessories, observe the minimum clearances/installation clearances (→ **fig. 4.3**).



4.3 Recommended minimum clearances/installation clearances

Key

A 165 mm (air/flue gas duct ∅ 60/100 mm)
246 mm (air/flue gas duct ∅ 80/125 mm)
B 180 mm
C 5 mm; optimum approx. 50 mm

500 mm in front of the boiler to enable easy access for servicing (may be provided by an opening door).

Clearance at the side is not required, but the side panels can also be removed if there is adequate side clearance (at least approx. 50 mm) in order to facilitate maintenance or repair work (→ **section. 4.8**).
It is not necessary to ensure sufficient clearance between the boiler and combustible materials or components as the temperature of the boiler will always be less than the maximum permissible temperature of 85 °C due to its nominal heat output.

4.4.2 Using installation templates

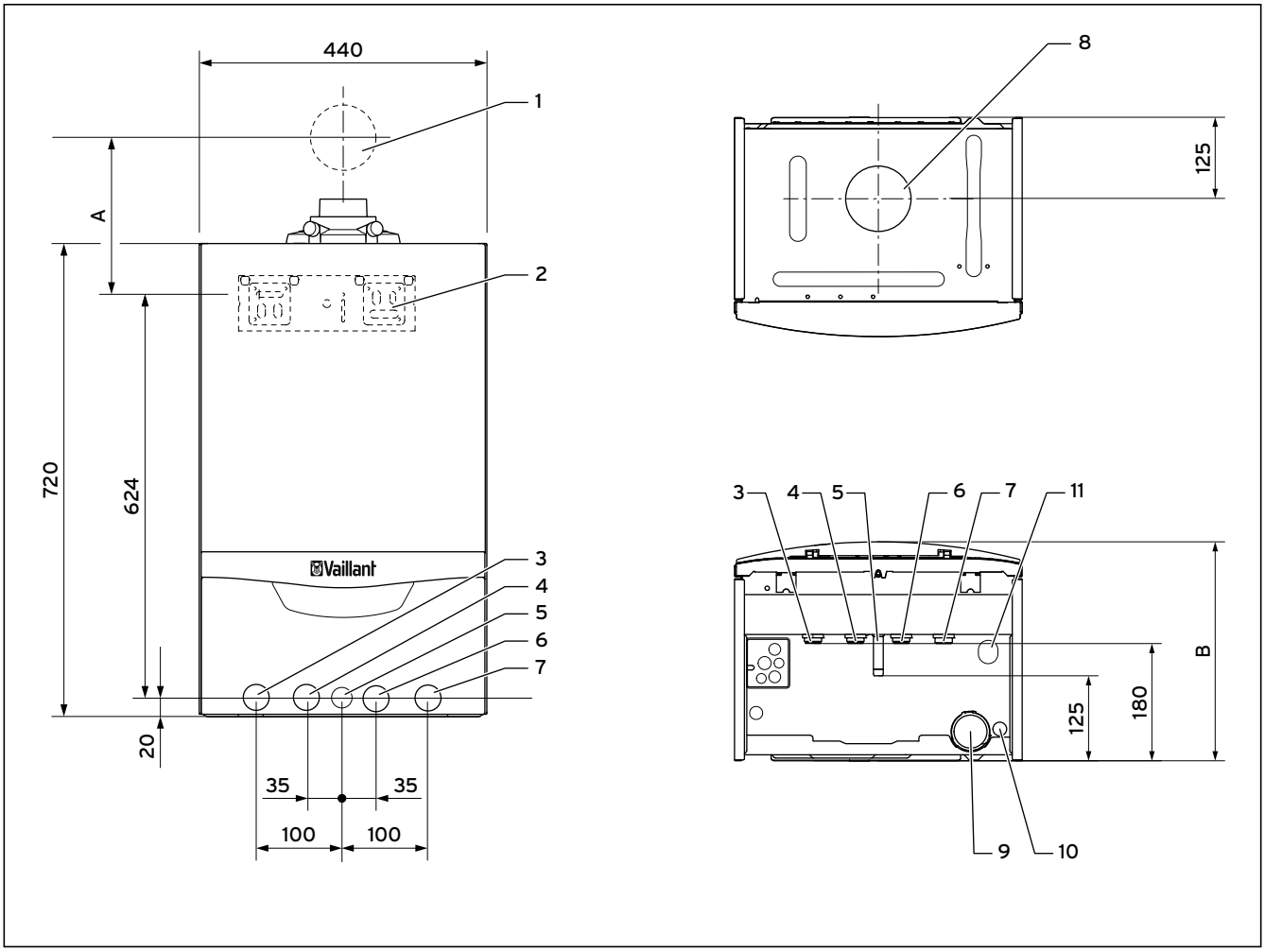
An installation template is supplied with the boiler to aid wall mounting.
The template shows the following:

- The position of the fixing holes for the hanging bracket.
- The position of the connections.
- The position of the wall breakthrough of the air/flue gas duct.

Position the installation template vertically over the installation site.

➤ Attach the template to the wall, using tacks for example.
➤ Mark the drill holes for the hanging bracket on the wall.
➤ If necessary, mark the position for the wall breakthrough for the air/flue gas duct.
➤ Remove the installation template from the wall.
➤ Drill 2 holes ∅ 10 mm for the hanging bracket in the wall.
➤ If necessary, cut the wall breakthrough for the air/flue gas duct.

4.5 Dimension drawing and connection measurements



4.4 Connection measurements in mm

Key

1 Wall breakthrough for air/flue gas duct
2 Hanging bracket
3 Heating flow (∅ 22 x 1.5)
4 Hot water connection (∅ 15 x 1.5), only for VUW boilers
5 Gas connection (∅ 15 x 1.5; ecoTEC 837: ∅ 22 x 1.5)
6 Cold water connection (∅ 15 x 1.5), only for VUW boilers
7 Heating return (∅ 22 x 1.5)
8 Air/flue gas duct connection
9 Condensate siphon
10 Condensate discharge connection, ∅ 19 mm
11 Heating expansion relief valve discharge pipe connection, ∅ 15 mm

Minimum dimension from wall bracket to center line of air/flue gas duct wall break-through	Dimension A [mm]
60/100 with elbow 87°, PP	175
80/125 with elbow 87°, PP	223

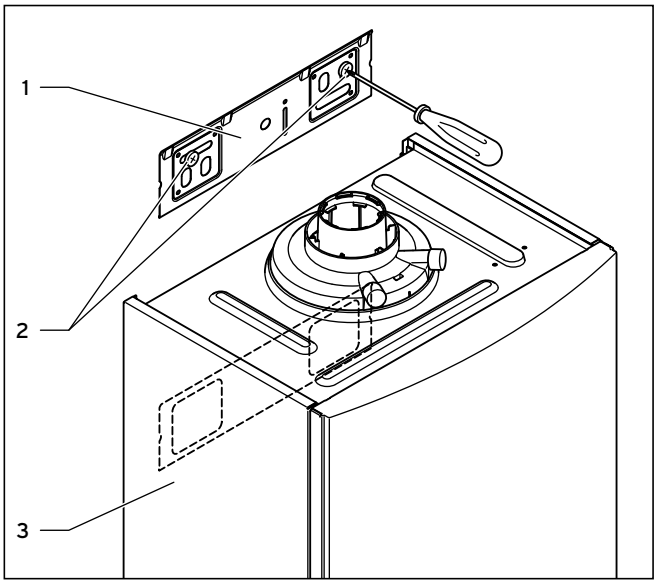
4.4 Dimension A for air/flue gas duct wall breakthrough with VU and VUW boilers

ecoTEC plus installation depth	Dimension B [mm]
612 (VU GB 126/5-5) 615 (VU GB 156/5-5) 618 (VU GB 186/5-5) 624 (VU GB 246/5-5) 824 (VUW GB 246/5-5) 831 (VUW GB 316/5-5)	335
630 (VU GB 306/5-5)	369
637 (VU GB 376/5-5) 837 (VUW GB 376/5-5)	403

4.5 Dimension B for installation depth on VU and VUW boilers

4.6 Wall-mounting the boiler

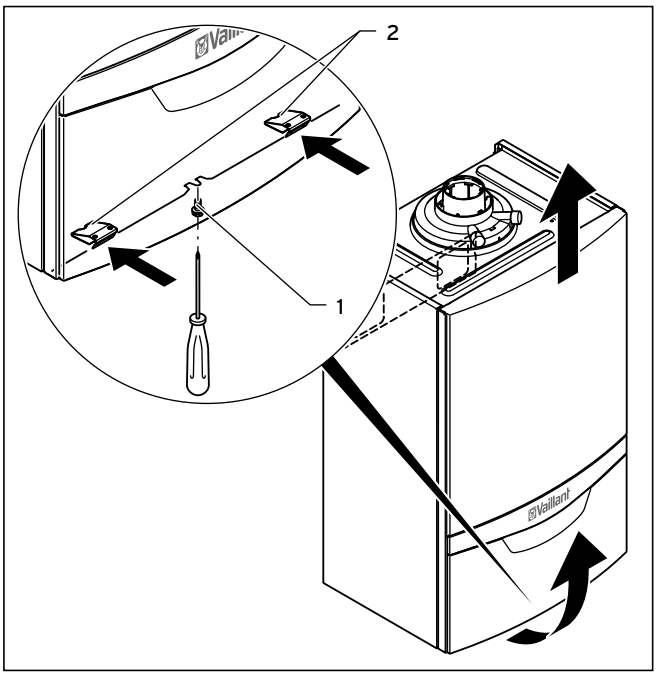
Danger!
Risk of death if the load-bearing capacity of the fixing elements used is insufficient!
If the fixing elements or wall do not have sufficient load-bearing capacity, the boiler can come loose and fall down. This may also cause leaks in the gas line, which is potentially fatal.
- ➤ When fitting the boiler, ensure that the fixing elements and the wall have a sufficient load-bearing capacity.
- ➤ Check the quality of the wall.



4.5 Wall-mounting the boiler

- ➤ Mount the hanging bracket (**1**) on the wall using the wall plugs and screws (**2**) provided with the unit.
- ➤ Hang the boiler (**3**) on the hanging bracket from above using the hanging bracket.

4.7 Removing/fitting the front casing



4.6 Removing the front casing

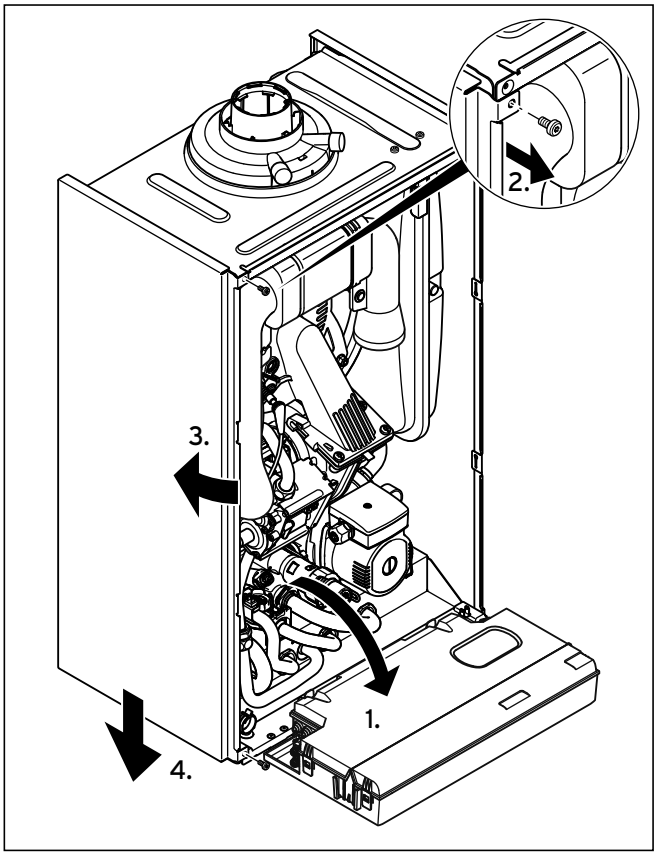
Removing the front casing
- ➤ Loosen the screw (**1**) on the bottom of the boiler using a screwdriver or small spanner.
- ➤ Push in both retaining clips (**2**) on the bottom of the boiler so that the front casing is released.
- ➤ Pull the front casing forwards using the bottom edge.
- ➤ Lift the front casing upwards from the bracket.

Fitting the front casing
- ➤ Place the front casing on the upper brackets.
- ➤ Push the front casing onto the boiler so that until both retaining clips (**2**) snap into place at the front casing.
- ➤ Fasten the front casing by screwing in the bolt (**1**) on the underside of the boiler.

4.8 Removing/fitting the side panel

You can also remove a side panel for installation or maintenance purposes.

Caution.
Risk of damage caused by mechanical tension.
Removing **both** side panels may cause mechanical distortion in the boiler, which can cause damage to the piping and potentially result in leaks.
- ➤ Always only remove **one** side panel, never both side panels at the same time.



4.7 Removing/fitting the side panel

Caution
Risk of damage to the side panel.
Unscrewed side panels that are merely suspended from the back wall can fall down.
- ➤ Hold onto the side panel when you are unscrewing it, and always remove it from the boiler.

- ➤ Fold the electronics box (**1.**) forwards.
- ➤ Unscrew the two screws (**2.**) from the top and bottom of the side panel.
- ➤ Hold onto the side panel (**3.**) when doing this.
- ➤ Swivel the side panel outwards and remove it from below by pulling it downwards (**4.**).
- ➤ Install the side panel in reverse order.

5 Gas installation

The work described in this section must only be carried out by a competent person.

5.1 Preparing for installation

Danger!
Risk of death from incorrectly installed gas system!
An incorrect gas installation can result in leaks and an explosion.
- ➤ During installation, the legal directives and the local regulations for gas supply companies must be observed.

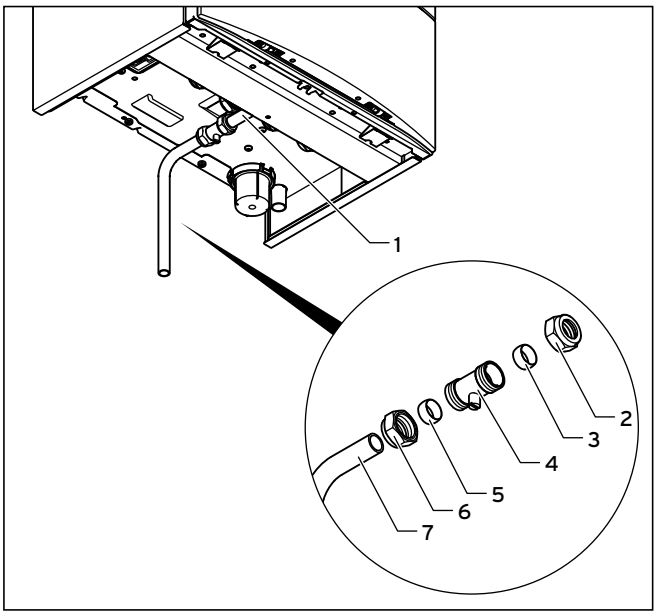
Danger!
Risk of death from incorrectly installed gas system!
Tension in the gas line can result in leaks or an explosion.
- ➤ Make sure there are no stresses in the gas lines when it is installed.

Caution.
Risk of damage caused by incorrect gas installation.
Excess test pressure or operating pressure can cause damage to the gas valve.
- ➤ When the entire gas installation is tested for leaks, the maximum pressure at the gas valve must not exceed 0.75 kPa (75 mbar).

Caution.
Risk of damage caused by contaminated lines.
Foreign bodies such as welding remnants. sealing residue or dirt in the connection lines for gas can cause damage to the boiler.
- ➤ Blow the gas line clean prior to installation.

Caution.
Risk of damage caused by using the wrong gas type.
Using the wrong gas type can cause a fault shutdown on the boiler. Furthermore, ignition and combustion noise may occur in the boiler.
- ➤ Only use propane gas for propane-fired boilers in accordance with BS 4250: Part 1 (1987).

5.2 Connecting the gas pipe



5.1 Fitting the gas connection (example: VUW boiler)

- ➤ Make the gas connection as shown.

6 Hydraulic installation

The work described in this section must only be carried out by a competent person.

6.1 Preparing for installation

Danger!
Risk of death caused by an incorrectly installed system!
Heating water that leaks from the discharge pipe of the expansion relief valve can cause severe burns.
- ➤ Install the expansion relief valve and its discharge pipe work termination ensuring that there is no danger to persons in or about the building. This may be outside or to a suitable open drain in the installation room.
- ➤ Make sure that the drain is visible.

Caution.
Risk of damage caused by contaminated lines.
Foreign bodies such as welding remnants, sealing residue or dirt in the water lines can cause damage to the boiler.
- ➤ Flush the heating installation thoroughly prior to installation.

Caution.
Risk of damage from corrosion.
If non-diffusion-tight plastic pipes are used in the heating installation, this may cause air to enter the heating water and corrosion of the heat generator circuit and the boiler.
- ➤ If using non-diffusion-tight plastic pipes in the heating installation, separate the system by installing an external heat exchanger between the boiler and the heating installation.

Danger!
Risk of scalding and/or damage due to incorrect installation leading to leaking water.
Stresses in the supply line can cause leaks.
- ➤ Make sure there are no stresses in the supply lines when they are installed.

Caution.
Risk of damage caused by heat transfer when soldering.
Heat that is transferred during soldering can cause damage to the seals in the service valves.
- ➤ Do not solder the connection pieces if the connection pieces are screwed to the service valves.

Seals made of rubber-like materials may be subject to plastic deformation, which can lead to pressure losses. We recommend using seals made of a paste-like fibre material.

The Vaillant ecoTEC boiler is equipped with a 10 l expansion vessel with a gas-side filling pressure of 0.075 MPa (0.75 bar), which is suitable for a closed heating system with a maximum water volume of 100 litres.

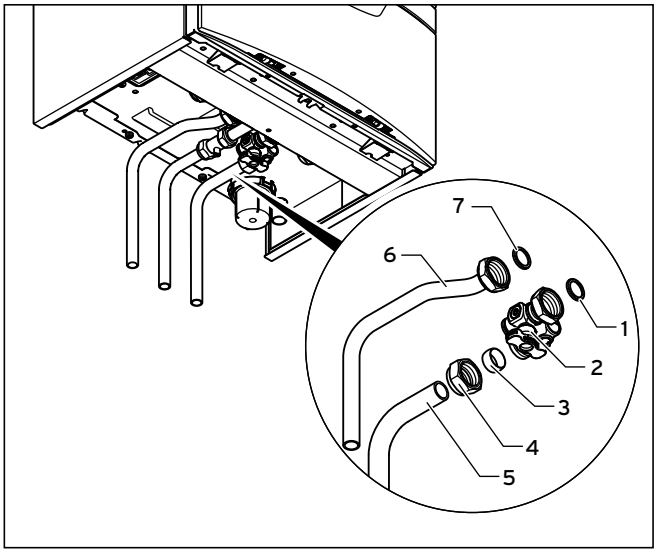
- ➤ Before installing the boiler, check whether the volume of the installed expansion tank is sufficient.
- ➤ If the volume of the expansion vessel is insufficient, then install an additional expansion vessel connected as close to the boiler as possible into the boiler return pipe.

When using an external expansion vessel together with a VUW boiler, it is advisable to install a non-return valve in the outlet (boiler flow) or take the internal expansion vessel out of service.
Otherwise, the warm start function may be more frequently activated because of backflow, which causes unnecessary energy loss.

	Vessel volume (in l)	
Initial system pressure (in bar)	**1.0**	**1.5**
Expansion relief valve setting (in MPa (bar))	**0.3 (3.0)**	
With system volumes greater than 100 l, multiply the volume by the adjacent factor.	0.109	0.156

6.1 Size of an additional expansion vessel

6.2 Connecting the hot and cold water (VUW boiler)



6.1 Fitting the hot and cold water connection

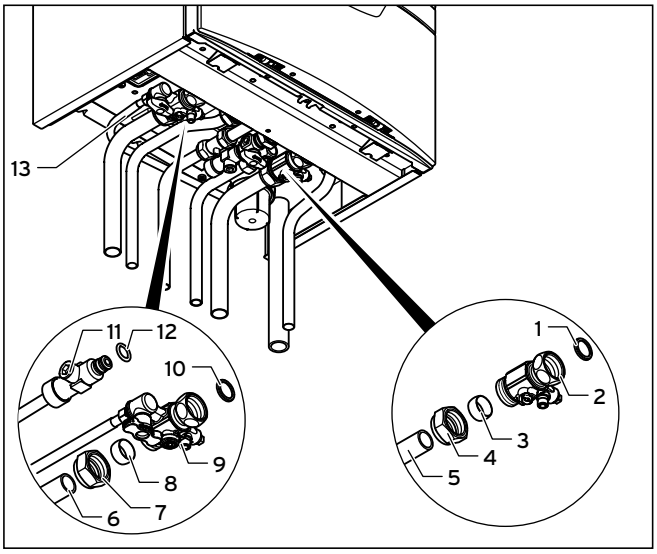
- ➤ Make the domestic hot and cold water connections as shown.
- ➤ Ensure correct water pressure and flow requirements and that any expansion can be accommodated with the cold supply pipe work (**→ section 2.5.7**).

6.3 Connecting the domestic hot water cylinder

- ➤ When connecting the domestic hot water cylinder to the ecoTEC plus, follow the **installation instructions** for the domestic hot water cylinder.

6.4 Connecting the heating flow and heating return

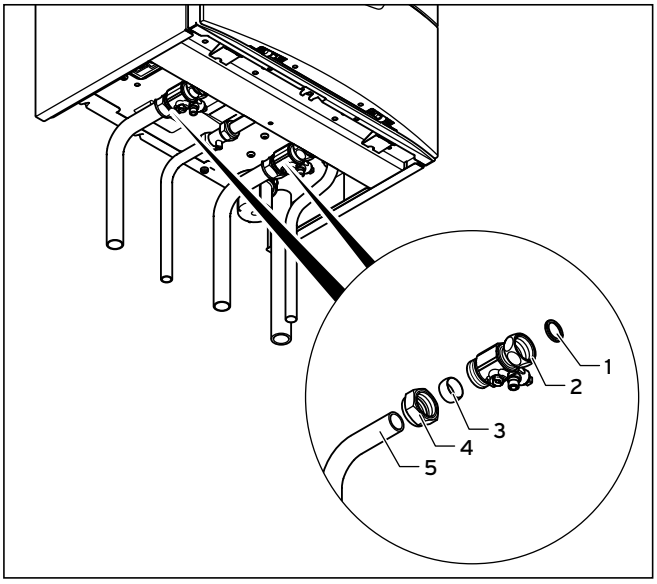
6.4.1 VUW boiler



6.2 Fitting the heating flow and heating return (VUW boiler)

- ➤ Make the water connections as shown.

6.4.2 VU boiler



6.3 Fitting the heating flow and heating return (VU boiler)

- ➤ Make the water connections as shown.

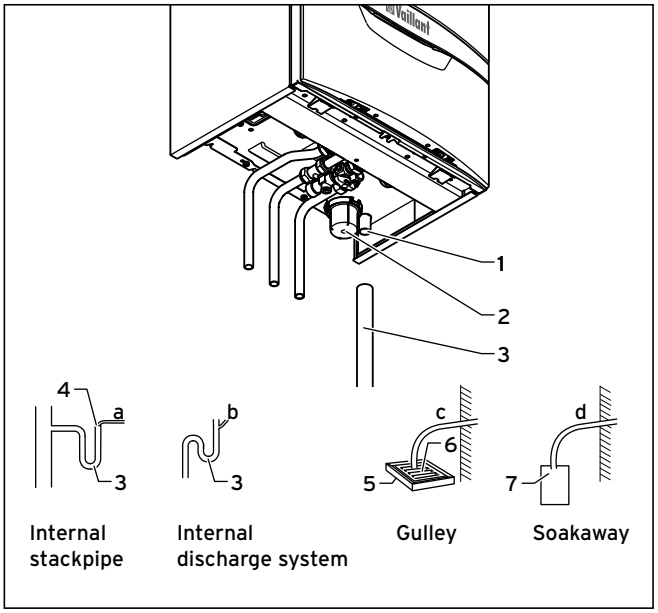
6.5 Low loss header

A low loss header disconnects the boiler from the heating system. The system is no longer dependent on the remaining feed head of the boiler. In conjunction with the boiler circulation pump, the low loss header ensures that a sufficiently high minimum quantity of water is always circulating through the boiler. No electrical accessories are required in order to use a low loss header.

6.6 Connecting the condensate discharge pipework

Danger!
Risk of death from flue gases!
An empty or insufficiently filled condensate water siphon can generate flue gas in the room air.
- ➤ Make sure that the condensate water siphon is filled with water when switching on the boiler.

The ecoTEC plus boilers are equipped with a condensate siphon. (The filling height is 145 mm). The siphon collects the condensate that has formed in a vessel with a capacity of approx. 200 ml, and intermittently deposits the contents to the discharge pipe. This minimises the risk of the discharge pipe freezing up.



6.4 Condensate discharge pipework

- ➤ Connect the condensate discharge (**1**) of the boiler to a condensate discharge pipework (**3**) which has a minimum internal diameter of 19 mm (22 mm outside diameter for all external pipes) and is made from an acid-resistant material (e.g. plastic overflow pipe).

The condensate discharge pipework must have a continuous fall (45 mm per metre) and should whenever possible terminate at a suitable discharge point **within the heated envelope of the building that will remain frost free under long periods of low external temperatures.**

- ➤ During installation remove all burs from inside of cut pipe work and avoid excessive adhesive which may trap small pockets of water close to the pipe wall which can freeze and build into a larger ice plug.
- ➤ As with other pipe work insulate the condensate discharge pipe to minimise any risk of freezing and beware when crossing cavities that the fall is maintained and the pipe sleeved.
- ➤ The condensate discharge pipework must terminate in a suitable location.

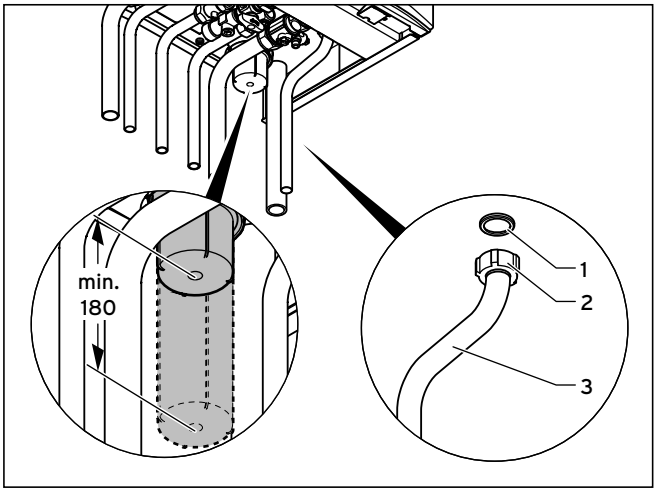
Further information can be obtained from "BS 6798 Specification for installation of gas-fired boilers of rated input not exceeding 70 kW net". The condensate siphon (**2**) must be filled with water as described in the relevant section before the boiler is commissioned.

6.7 Connecting the discharge pipe to the expansion relief valve on the boiler

The expansion relief valve for the heating installation is integrated in the boiler.
- ➤ Install the discharge pipe for the expansion relief valve so that it does not interfere with the removal and fitting of the condensate trap.

We recommend not to shorten the discharge pipe supplied.

- ➤ Leave an installation space of at least 180 mm beneath the condensate siphon.



6.5 Fitting the discharge pipe to the expansion relief valve (example: VUW boiler)

- Insert a seal (**1**) in the cap nut (**2**).
- Screw the discharge pipe (**3**) onto the expansion relief valve.
- Make the discharge line routing as short as possible and sloping away from the boiler.
- Allow the line to terminate in such a way that nobody can be injured and no cable or other electrical components can be damaged if water or steam is ejected.
- Note that the end of the line must be visible.
- If the pipe cannot fall to a safe discharge point then the Vaillant remote pressure relief valve mounting kit can be used to provide a suitable way to achieve this.
- Ensure the discharge pipe work is installed, routed and terminated correctly to minimise the risk of freezing up.

7 Flue gas installation

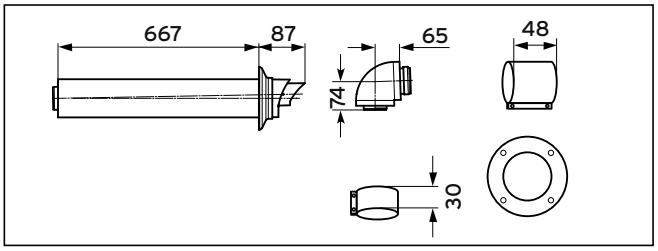
7.1 Air/flue gas duct

Danger!
Risk of death and risk of damage from use of non-approved air/flue gas ducts!
Vaillant boilers are system-certified only in combination with genuine Vaillant air/flue gas ducts. The use of other accessories can cause personal injury and material damage as well as operating faults.
- ➤ Only use genuine Vaillant air/flue gas ducts.

The CE mark is valid only if the appliance is operated with Vaillant air/flue gas ducts.

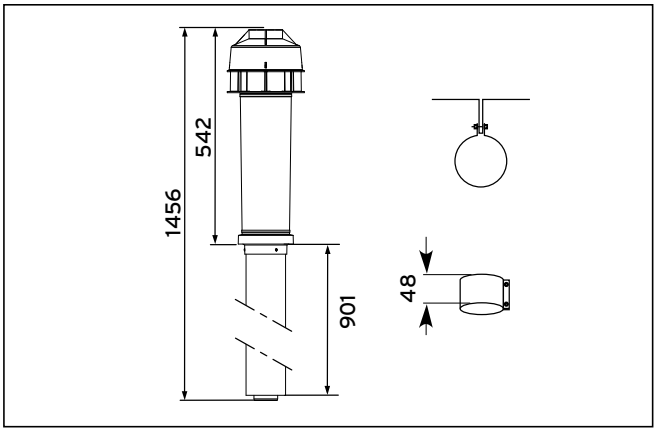
All ecoTEC plus boilers feature a 60/100 mm diameter air/flue gas connection as standard. Selecting the most suitable system depends on the individual installation and application conditions.

Standard 100 mm air/flue gas duct



7.1 Scope of delivery of horizontal air/flue gas duct
Article number 303933

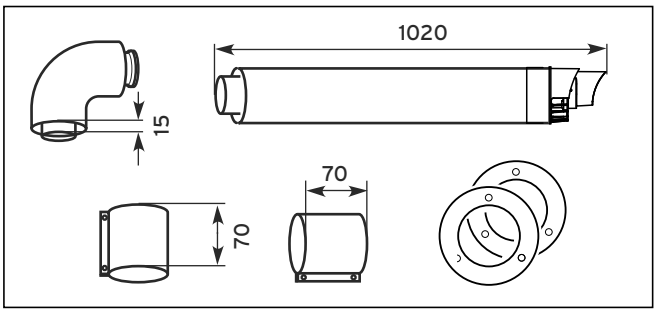
A concentric air/flue gas duct with an outer diameter of 100 mm that can be extended depending on the boiler output range is available.
You can also get a vertical system. For more information refer to the **➞ installation manual for the air/flue gas duct**. 87° elbows and 45° elbows are also available for greater flexibility during installation.



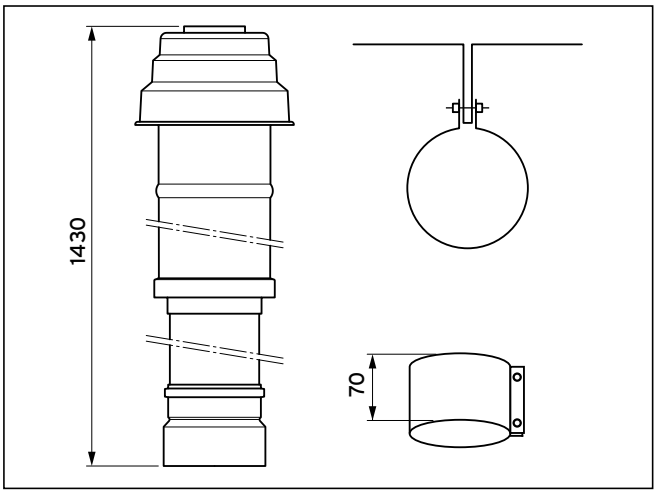
7.2 Scope of delivery of vertical air/flue gas duct
Article number 0020060570 and 0020065937

Optional 125 mm air/flue gas duct

A concentric air/flue gas duct with an outer diameter of 125 mm is available that can be extended depending on the boiler output range. The flues gas spigot Ø 80/125 (with 2 measuring apertures) Art. No.: 0020147469 will be required. You can also get a vertical system. For more information refer to the **➞ installation manual for the air/flue gas duct**.



7.3 Scope of delivery of horizontal air/flue gas duct
Article number 303209



7.4 Scope of delivery of vertical air/flue gas duct
Article number 303200

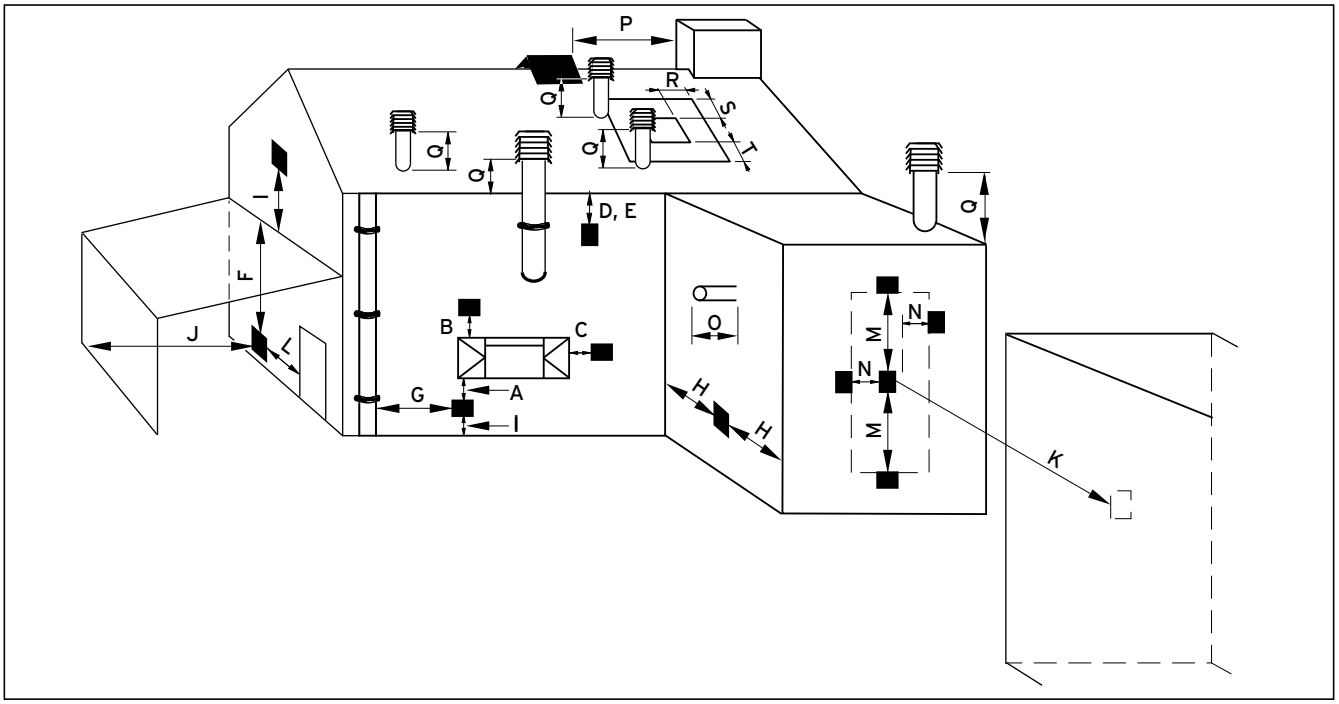
7.2 Flue termination

The following details refer to all flue systems.

a. The terminal must be positioned such that the products of combustion can disperse freely at all times.
b. A plume of water vapour will sometimes be visible from the flue terminal. Positions where this could be a nuisance should be avoided.
c. If the terminal is fitted less than 2 m above a balcony, above ground or above a flat roof to which people have access then a suitable terminal guard must be provided and fitted (contact Tower Flue Components, Tonbridge, TN9 1TB).

Vertical flues must not terminate within 600 mm of an openable window, air vent or any other ventilation terminal.

The flue system shall be so placed or shielded as to prevent ignition or damage to any part of the building.



7.5 Termination of the air/flue gas duct

	Location	Minimum dimensions
A	Directly below an opening, air brick, opening windows, etc.	300 mm
B	Above an opening, air brick, opening window, etc.	300 mm
C	Horizontally to an opening, air brick, opening window, etc.	300 mm
D	Below temperature-sensitive building components e.g. plastic gutters, soil pipes or drain pipes	75 mm
E	Below eaves	200 mm
F	Below balconies or car port roof	200 mm
G	From a vertical drain pipe or soil pipe	150 mm
H	From an internal or external corner	200 mm
I	Above ground, roof or balcony level	300 mm
J	From a surface facing the terminal	600 mm
K	From a terminal facing the terminal	1200 mm
L	From an opening in the car port (e.g. door, window) into the dwelling	1200 mm
M	Vertically from a terminal on the same wall	1500 mm
N	Horizontally from a terminal on the same wall	300 mm
O	From the wall on which the terminal is mounted	0 mm
P	From a vertical structure on the roof	N/A
Q	Above intersection with roof	300 mm
R	Horizontally to a window or opening on pitched or flat roofs	600 mm
S	Above a window or opening on pitched or flat roofs	600 mm
T	Below a window or opening on pitched or flat roofs	2000 mm

7.1 Position of the termination in a fan-assisted air/flue gas duct

BS 5440-1 It is recommended that the fanned flue terminal should be positioned as follows:

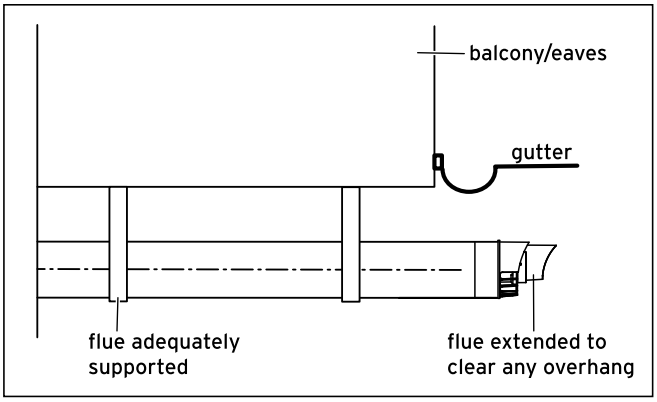
a) at least 2 m from an opening in the building directly opposite, and

b) so that the products of combustion are not straightly directed to discharge across a boundary.

1) Dimensions D, E, F and G:
These clearances may be reduced to 25 mm without affecting the performance of the boiler. In order to ensure that the condensate plume does not affect adjacent surfaces the terminal should be extended as shown in **→ fig. 7.6**.

2) Dimension H:
This clearance may be reduced to 25 mm without affecting the performance of the boiler. However, in order to ensure that the condensate plume does not affect adjacent surfaces a clearance of 300 mm is preferred. For IE, recommendations are given in the current edition of IS 813.

For 1 and 2 above you can use the Variable Termination Kit to move the termination point away from the building fabric.
Article numbers:
0020060584 - White
0020060585 - Black



7.6 Termination of air/flue gas duct under balcony or eaves

8 Electrical installation

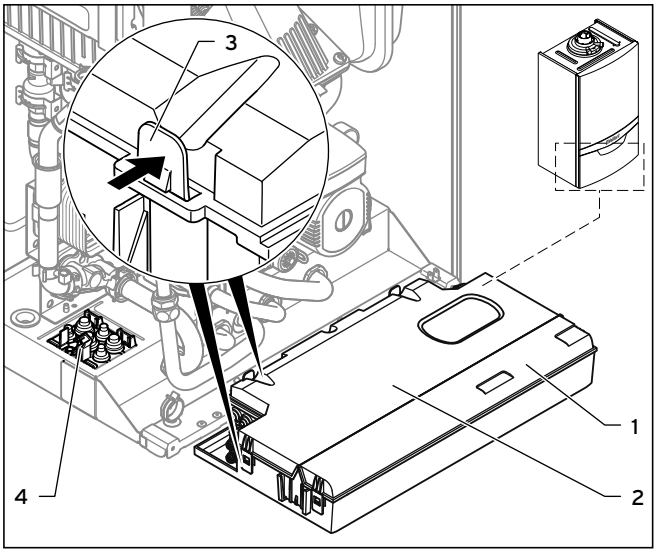
8.1 Preparing for installation

Danger!
Risk of death from electric shock!
Touching live connections can cause serious personal injury.
- ➤ Switch off the power supply.
- ➤ Secure the power supply against being switched on again.

Danger!
Risk of electrocution as a result of an improper electrical connection!
An improper electrical connection may negatively affect the operational safety of the boiler and result in material damage or personal injury.
- ➤ The electrical connection must be carried out by a suitably qualified competent person who is responsible for complying with the existing standards and guidelines.
- ➤ Connect the boiler in accordance with BS 7671 (IEE Regulations).
- ➤ For IE: Please observe the latest edition of the ETCI regulations (Electro-Technical Council for Ireland).
- ➤ Earth the boiler.

8.2 Opening/closing the electronics box

Opening the electronics box
- ➤ Remove the front casing from the boiler (→ **section 4.7**).



8.1 Opening the back wall of the electronics box

- ➤ Fold the electronics box (**1**) forwards.
- ➤ Undo the 4 clips of the rear cover (**2**) of the electronics box from the brackets (**3**) at the rear and sides of the electronics box.
- ➤ Fold up the cover.

Closing the electronics box
- ➤ Close the rear panel on the electronics box.
- ➤ Push in the panel until it clicks into place in the clips.
- ➤ Fold up the electronics box.
- ➤ Push the right and left clips of the box against the side panels on the boiler until they click into place.
- ➤ Replace the front casing on the boiler (→ **section 4.7**).

8.3 Establishing the mains connection

Danger!
Risk of death from electric shock!
Mains connection terminals L and N remain live even if the continuous on/off switch is turned off!
- ➤ Before establishing a mains connection, switch off the power supply.

Caution.
Risk of damage from erroneous connected voltage.
At mains voltages greater than 253 V and less than 190 V, the functions may be impaired.
- ➤ Make sure that the rated voltage of the mains is 230 V.

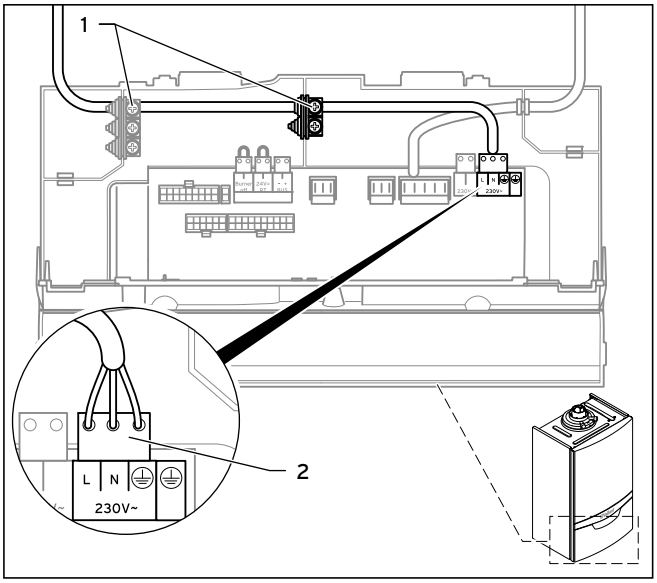
Caution.
Risk of damage caused by incorrect installation.
A mains voltage at the incorrect plug terminals on the ProE system can destroy the electronics.
- ➤ Only connect the mains connection cable to the terminals marked for the purpose.

Caution.
Risk of damage caused by incorrect installation.
Connecting wires that have been stripped too far can cause short circuits and damage the electronics if a strand accidentally comes loose.
- ➤ Only strip the outer sheathing of flexible cables for a maximum of 3 cm to prevent short circuits.
- ➤ Lay the lines correctly.
- ➤ Use strain reliefs.

If you install the boiler in safety area 2, it can only be operated if it is room sealed. Installation method B53P is not permitted in this case. Please pay attention to the latest edition of the "IEE Wiring Regulations – BS7671, Requirements for Electrical Installation".

In IE, reference should be made to the current edition of the ETCI (Electro-Technical Council for Ireland) rules.
The boiler is supplied for connection to 230 V, ~ 50Hz supply fused at 3 A rating. Connection to the mains supply shall be made via a fused 3 pin plug to an unswitched shuttered socket, both complying with the requirements of BS 1363. (Alternatively, connection may be made via a 3 A fused double pole isolator having a contact opening of at least 3 mm in all poles and supplying the boiler and controllers only). The point of connection to the mains supply must allow complete electrical isolation of the boiler and its ancillary controllers. It should be readily accessible and adjacent to the boiler. A flexible cord fulfilling BS6500 or comparable standard, conductor diameter between 0,75 and 1,5 mm^2 and an allowed temperature range including 90 °C should be used.
The nominal voltage of the mains must be 230 V; at mains voltages greater than 253 V and less than 190 V the functions may be impaired.

- ➤ Open the electronics box (→ **section 8.2**).
- ➤ Use a normal commercial mains connection cable that is compliant with standards.
- ➤ Route the mains connection cable through the left cable duct (→ **fig. 8.1, pos. 4**) on the base of the unit.



8.2 Cable routing of the mains connection cable

- ➤ Use the strain reliefs (**1**) provided.
- ➤ Shorten the mains connection cable as necessary.
- ➤ Only strip the outer sheathing of flexible cables for a maximum of 3 cm.
- ➤ Ensure inner conductor insulation is not damaged during stripping of outer sheathing.
- ➤ Only strip inner conductors sufficient to make good sound connections.
- ➤ Crimp pin terminals to ensure a secure connection free from loose strands to prevent short circuits.
- ➤ Connect the provided green ProE plug (**2**) for the mains connection to the mains connection cable using a screwdriver.
- ➤ Insert the ProE plug into the corresponding PCB slot (L, N and earth) (→ **fig. 8.2**).
- ➤ Lay the lines correctly.
- ➤ Secure the cable in the electronics box using the strain reliefs.
- ➤ Close the electronics box (→ **section 8.2**).

Make sure that the connection cables are securely fastened to the plug terminals.

8.4 Connecting the controller

8.4.1 Fitting the controller

- ➤ Fit the controllers in accordance with the relevant operating and installation instructions.

8.4.2 Connecting controllers to the electronic system

Caution.
Risk of damage caused by incorrect installation.
Connecting wires that have been stripped too far can cause short circuits and damage the electronics if a strand accidentally comes loose.
- ➤ Only strip the outer sheathing of flexible cables for a maximum of 3 cm to prevent short circuits.
- ➤ Lay the lines correctly.
- ➤ Use strain reliefs.

Caution.
Risk of damage from incorrect installation.
A mains voltage at the incorrect plug terminals on the ProE system can destroy the electronics.
- ➤ Do not connect a mains voltage to the eBUS terminals (+/-).

Make sure that the conductors are securely fastened to the plug terminals of the ProE plug.

- ➤ Open the electronics box (➞ **section 8.2**).
- ➤ Lead the supply lines of the components to be connected (e.g. external controllers, external sensors) through the left cable duct (➞ **fig. 8.1, pos. 4**) on the underside of the boiler.
- ➤ Use the strain reliefs provided.
- ➤ Shorten the supply lines as necessary.
- ➤ Only strip the outer sheathing of the supply lines for a maximum of 3 cm.
- ➤ Ensure inner conductor insulation is not damaged during stripping of outer sheathing.
- ➤ Only strip inner conductors sufficient to make good sound connections.
- ➤ Fit the stripped ends of the conductors with crimp pin terminals to ensure a secure connection free from loose strands to prevent short circuits.
- ➤ Connect the ProE plug to the supply lines of the controller using a screwdriver.
- ➤ Insert the ProE plug into the associated PCB slot (➞ **figs. 8.3 and 8.4**).
- ➤ Lay the lines correctly.
- ➤ Secure the cable in the electronics box using the strain reliefs.
- ➤ If you connect a 230 V AC time and temperature control to the boiler, then remove the bridge at input 24 V = RT (X100 or X106) if a bridge exists.
- ➤ If you connect a weather compensator or room temperature control via eBUS, then bridge input 24 V = RT (X100 or X106) if no bridge exists.
- ➤ I If using low voltage (24 V) controls connect these in place of the bridge marked RT 24 V (X100 or X106).
- ➤ Close the electronics box (➞ **section 8.1**).
- ➤ In order to achieve pump operating mode "Comfort" (continuously running pump) for multi-circuit controllers, change diagnosis code D.018 Pump operating mode from "Eco" (intermittent pump) to "Comfort" (➞ **section 11.1.2**).

Please note that the bridge at the ProE plug (Burner off) must be removed when connecting a maximum thermostat (contact thermostat) for underfloor heating.

8.5 Connecting additional components

Caution.
Risk of damage caused by incorrect installation.
Connecting wires that have been stripped too far can cause short circuits and damage the electronics if a strand accidentally comes loose.
- ➤ Only strip the outer sheathing of flexible cables for a maximum of 3 cm to prevent short circuits.
- ➤ Lay the lines correctly.
- ➤ Use strain reliefs.

You can actuate an additional component with the aid of the auxiliary relay that is installed in the ecoTEC plus (only ecoTEC 637/837), and two other components with the multifunctional module.

The following components can be actuated:
- Circulation pump
- External pump
- Cylinder charging pump
- Extractor hood
- External solenoid valve
- External fault signal
- Solar pump (not active)
- eBUS remote control (not active)
- Legionella protection pump (not active)
- Solar valve (not active)

8.5.1 Connecting the auxiliary relay (grey connector on PCB)

You can connect the additional component to the integrated auxiliary relay using the grey plug on the PCB.

- ➤ Perform the wiring in the same way as in **→ section 8.4**.
- ➤ To start up the connected components, select the components using diagnosis code "D.026" at installer level (**→ section 11.1**).

8.5.2 Connect VR 40 – "2 from 7" multi-functional module

You can connect additional components to the ecoTEC plus using the Vaillant multi-functional module 2 in 7 (accessories).

- ➤ Fit the components in accordance with the corresponding operating and installation instructions.
- ➤ Select diagnostics code "D.027" to actuate relay 1 on the multi-functional module at installer level (**→ section 11.1**).
- ➤ Select diagnostics code "D.028" to actuate relay 2 on the multi-functional module at installer level (**→ section 11.1**).

8.6 Actuating the circulation pump demand-controlled

You can actuate the circulation pump for a domestic hot water cylinder demand-controlled using the ecoTEC plus.

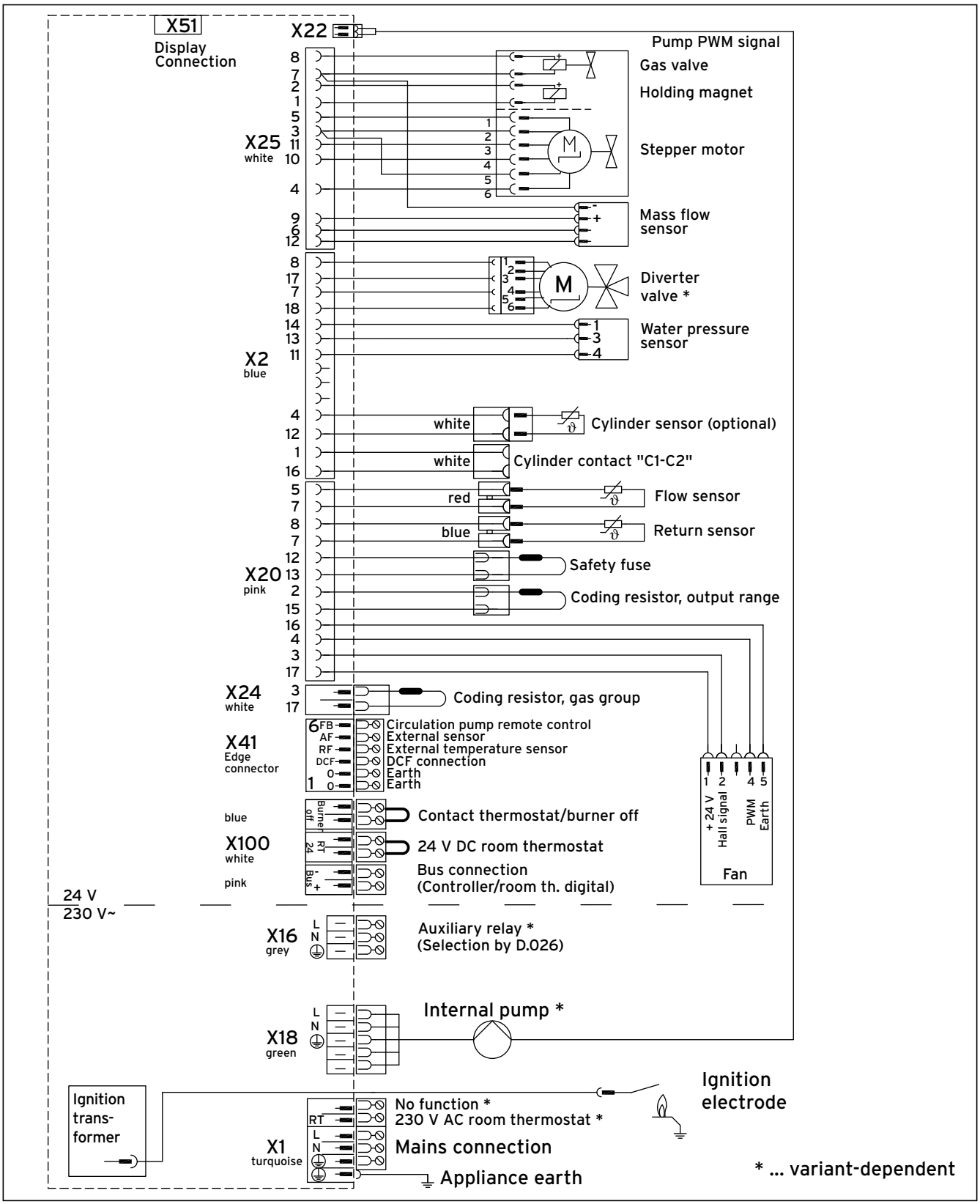
Caution.
Risk of damage caused by incorrect installation.
Connecting wires that have been stripped too far can cause short circuits and damage the electronics if a strand accidentally comes loose.

- ➤ Only strip the outer sheathing of flexible cables for a maximum of 3 cm to prevent short circuits.
- ➤ Lay the lines correctly.
- ➤ Use strain reliefs.

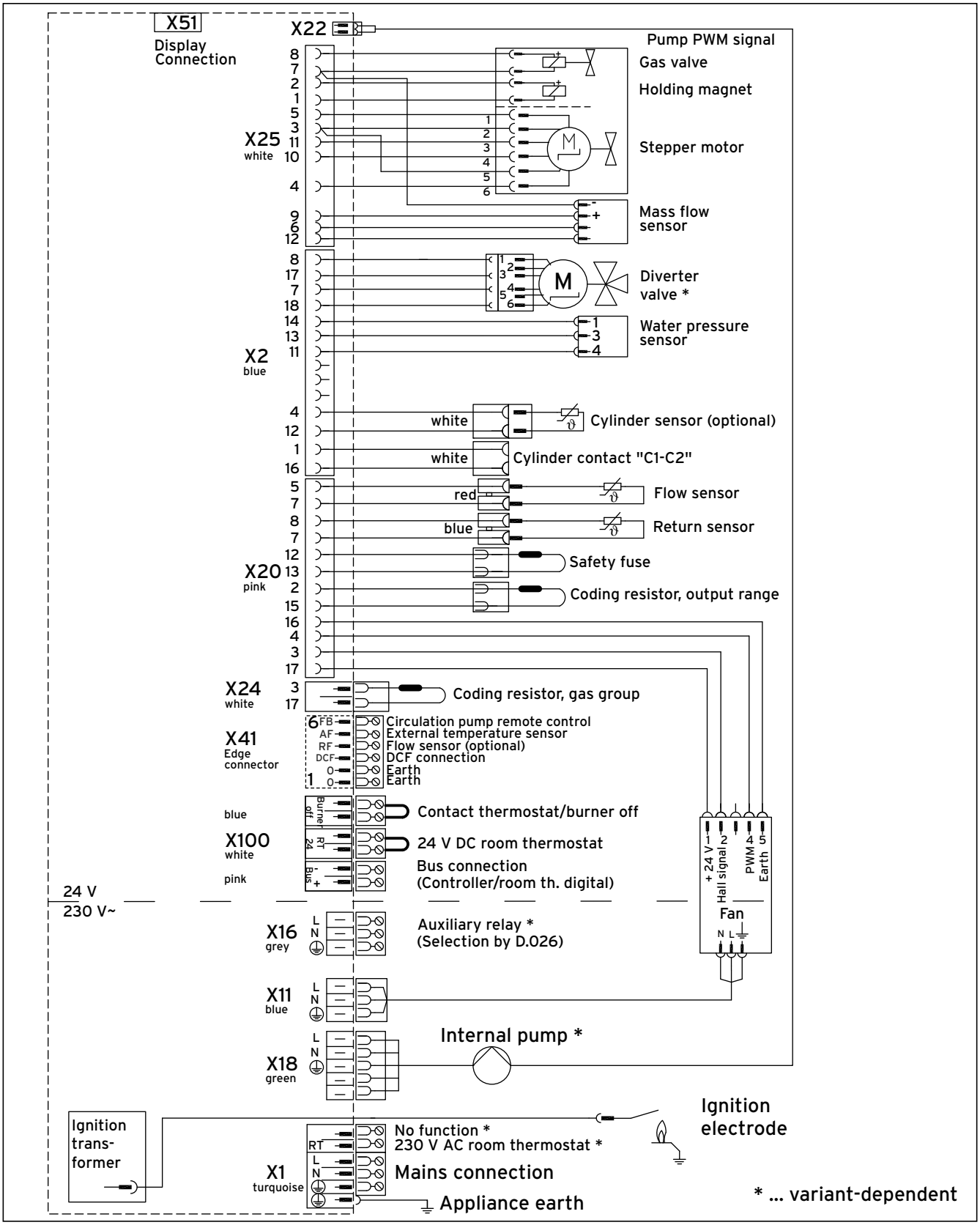
- ➤ Perform the wiring in the same way as in **→ section 8.4**.
- ➤ Connect the supply line of the external button with terminals X41/1 ⏚ (0) and X41/6 (FB) of the PCB (**→ fig. 8.3 and 8.4**).

The edge connector required for this is included with your controller.

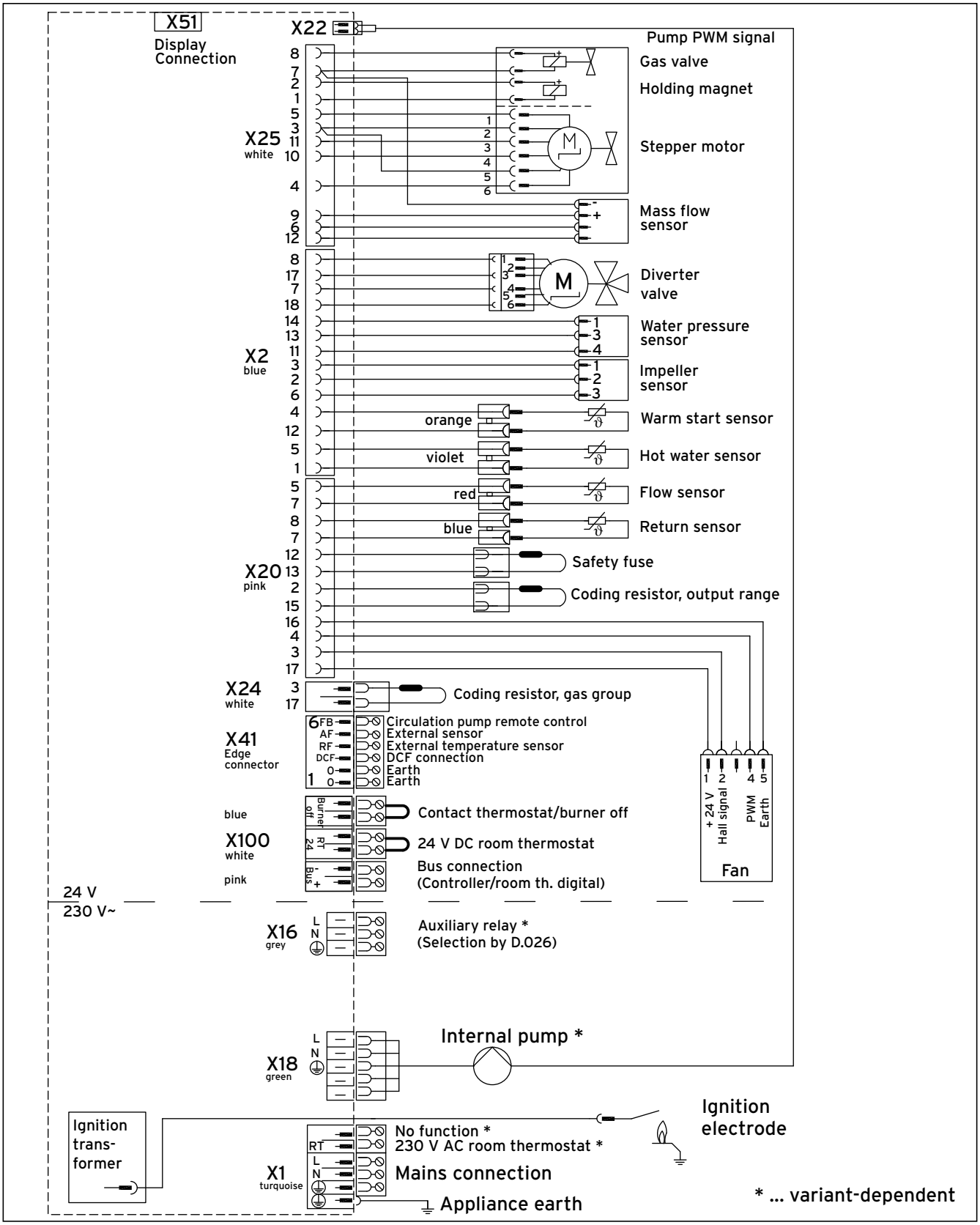
8.7 Connection diagrams



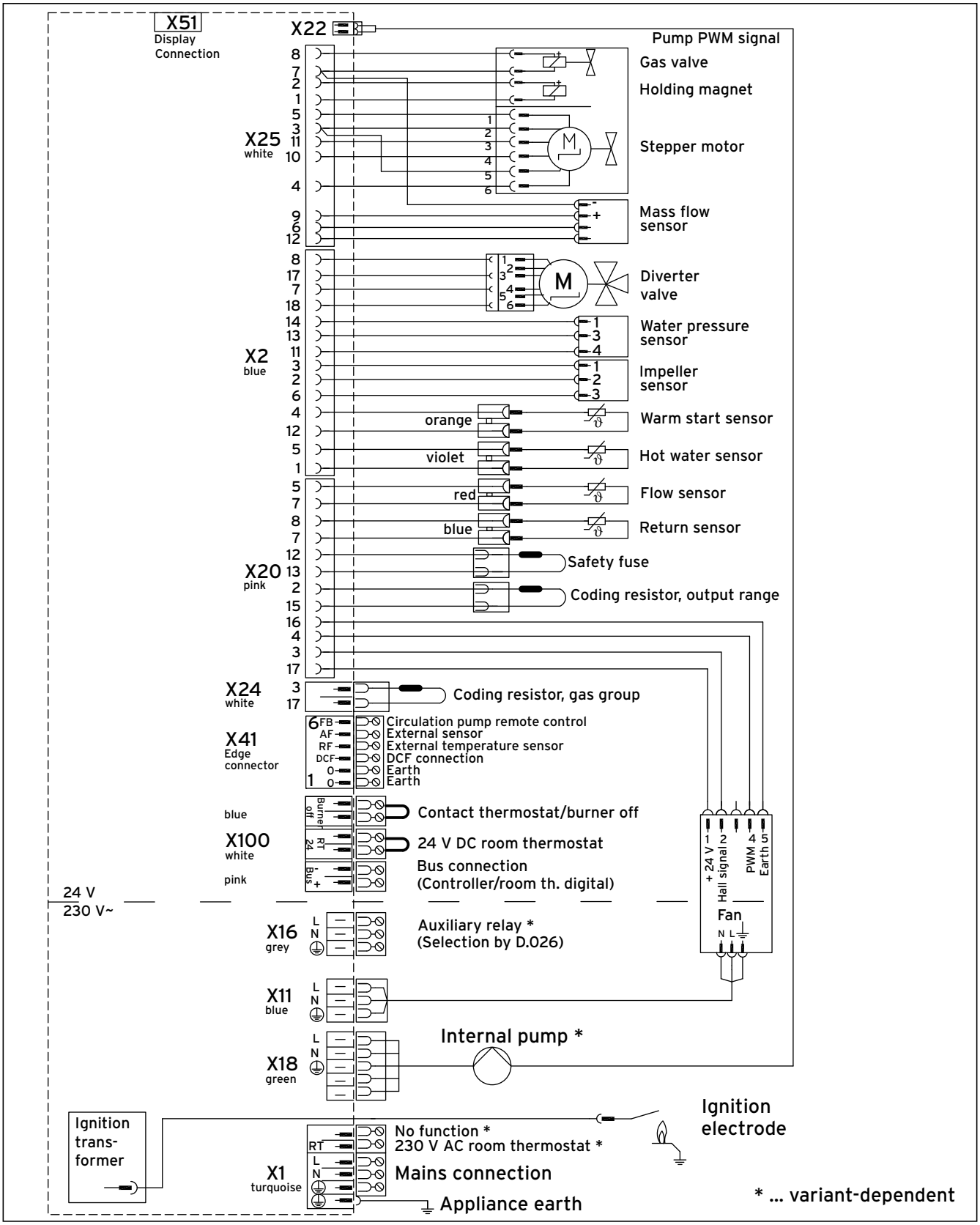
8.3 Connection diagram for electronics box ecoTEC plus 612, 615, 618, 624, 630



8.4 Connection diagram for electronics box ecoTEC plus 637



8.5 Connection diagram for electronics box ecoTEC plus 824, 831



8.6 Connection diagram for electronics box ecoTEC plus 837

9 Operation

The Vaillant ecoTEC plus boiler is fitted with a digital information and analysis system (DIA). If additional settings are required, which have not been configured using the installation assistant, you can view and modify further parameters using the DIA.

The operating concept and operation of the boiler is described in the → **operating instructions** of the boiler. The read-off and setting facilities of the operator level are also described in the → **operating instructions**.

The following overview shows the read-off and setting facilities of the installer level.

9.1 Calling up the installer level

Caution.
Risk of damage caused by incorrect handling.
Incorrect settings at installer level can cause damage to the heating installation.
➤ You should only access installer level if you are an approved competent person.

Installer level is secured against unauthorised access with a password, as incorrect parameter settings at this level can cause functional faults and damage to the heating installation.

➤ Press the left and right selection buttons ("i") **simultaneously**

The following menu appears on the display.

➤ Scroll using the minus button or the plus button until the menu point "installer level" appears.
➤ Press the right selection button to select the menu point.

"Enter code" and the value "00" appear in the display.

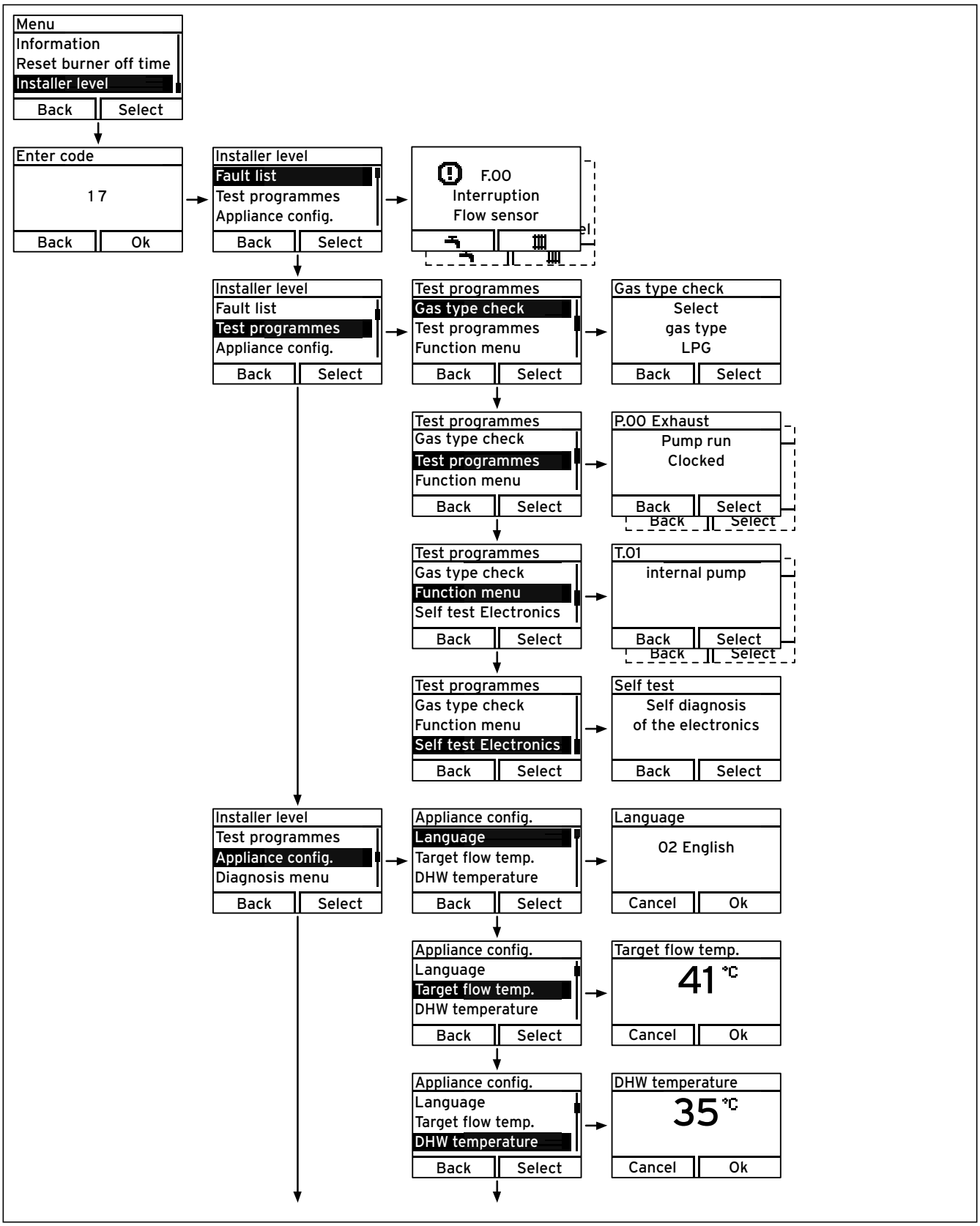
➤ Select the value 17 (code) using the minus button or the plus button .
➤ Press the right selection button to confirm the entered code.

The installer level appears with a selection of menu points.

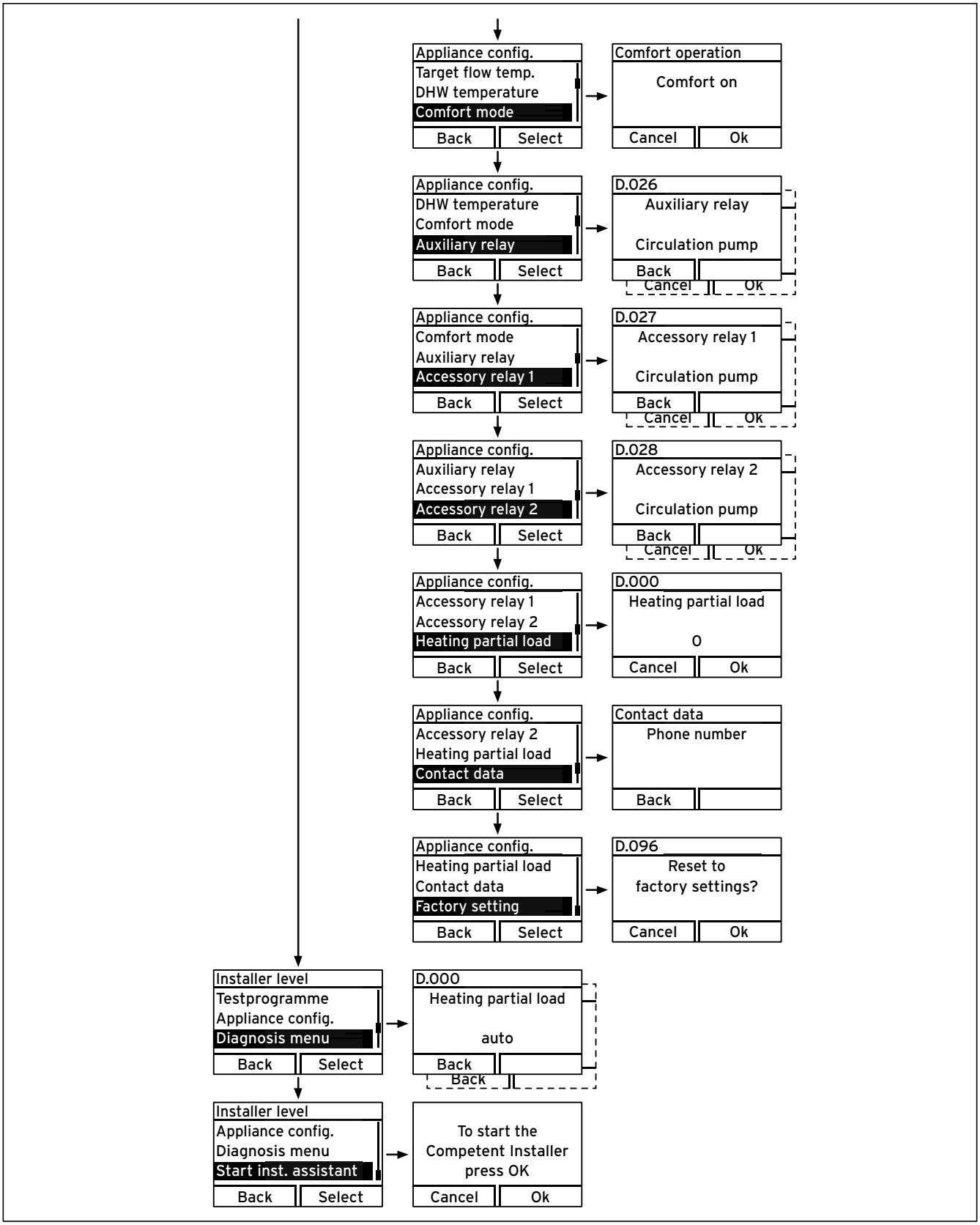
In the following, a path specification at the beginning of an action instruction specifies how to access this function in the installer level, e.g. **Menu → Installer level → Test programs → Test programs**.

If you exit the installer level and then access it again within 15 minutes, you do not have to enter the code again.

9.2 Overview of the menu structure



9.1 Overview of the menu structure for installer level part 1



9.2 Overview of the menu structure for installer level part 2

10 Commissioning

At the time of commissioning, complete all relevant sections of the benchmark checklist found within the back pages of this document.
Ensure that the filling and purging programs P.06 and P.00 have been allowed to run fully before the boiler is ignited for the first time.

Danger!
Risk of poisoning and burns caused by escaping hot flue gas!
Hot flue gas can escape and cause poisoning and burns if the boiler is operated with an incompletely mounted or open air/flue gas duct or if the boiler is operated with internal leaks with the front casing open.

- ➤ Operate the boiler
  - for commissioning
  - for testing purposes
  - in continuous operation

  only when the front casing is fitted and closed and the air/flue gas duct is completely mounted.
- ➤ Exclusively for test purposes such as gas working pressure testing the boiler may be operated with the front casing removed for short durations ONLY but must have a completely mounted air/flue gas duct.

The automatic air vent cap must be loosened before filling the heating circuit or recharging circuit and during operation.
Purge the heating circuit and the recharging circuit using the purging program P.00 (→ **section 10.4**).

Auxiliary service equipment:
The following test and measuring equipment is required for commissioning:
- CO_2 measuring instrument
- Digital or U-tube manometer

10.1 Switching on the boiler

➤ Press the on/off button (→ **Operating instructions**).

The basic display appears on the display.

10.2 Installation assistant

The installation assistant is launched when switching on the boiler for the first time. It provides easy access to the most important test programs and configuration settings for installing the boiler. The installation assistant is displayed whenever the boiler is switched on until it has been successfully completed.
You must confirm the start of the installation assistant. Once confirmed, all of the heating and hot water demands from the boiler are blocked. This status remains until the installation assistant is completed or cancelled.
If you do not confirm the start of the installation assistant, it will be closed 10 seconds after being switched on and the basic display will appear. The next time the boiler is switched on using the on/off button, the installation assistant will be started again.

10.2.1 Language

➤ Select the required language using the minus or plus button.
➤ Press the right selection button to confirm the selected language.

The language change must be confirmed a second time in order to avoid an unintentional change.

If you unintentionally select a language that you cannot understand, you can change it again as described below.

➤ Press the right selection button and the plus button **simultaneously and hold** them down.
➤ Press the fault clearance key for a short time.
➤ Keep the right selection button and the plus button pressed until the option for changing the language appears on the display.
➤ Select the language of your choice using the minus key or the plus key.
➤ Confirm the change by pressing the right-hand selection button ("OK").

10.2.2 Filling mode

Filling mode (test program P.06) is activated automatically in the installation assistant for as long as it appears on the display. (→ **section 10.4**).

10.2.3 Purging

➤ Start test program P.00 to purge the system (→ **section 10.4**).
Unlike the way in which it is started in the test programs menu, the purge program P.00 is started in the installation assistant by pressing the minus button or the plus button.
In order to change the circuit that is being purged, you can press the right selection button.

10.2.4 Target feed temperature

Use the minus button and the plus button to set the target feed temperature. Confirm your setting with OK.

10.2.5 Hot water temperature

Use the minus button and the plus button to set the hot water temperature. Confirm your setting with OK.

10.2.6 Comfort mode

Use the minus button and the plus button to enable or disable comfort mode. Confirm your setting with OK.

10.2.7 Heating partial load

The heating partial load of the Vaillant ecoTEC plus boiler is factory set to "auto". This means that the boiler independently determines the optimum heating output depending on the current heat demand of the system. A setting is normally no longer required.
The setting can also be changed later using diagnostics point D.000.

If you have activated return control under D.17, the automatic heating output determination function is not active. If you set d.00 to "auto" anyway, the boiler operates with the maximum possible heating partial load.

10.2.8 Auxiliary relay and multi-functional module

Additional components that are attached to the boiler can be adjusted directly here.
This setting can be changed using diagnostics codes D.026, D.027 and D.028.

10.2.9 Competent person telephone number

You can store telephone numbers in the menu.
The operator can display these in the information menu.
The telephone numbers can be up to 16 digits long and must not contain any spaces. If the telephone number is shorter, end the entry after the last digit by pressing the right selection button.
All of the digits to the right will be deleted.

10.2.10 Terminating the installation assistant

If you have successfully run through and confirmed the installation assistant, it will not start up automatically next time the unit is switched on.

10.2.11 Restarting the installation assistant

You can restart the installation assistant any time by calling it up manually in the menu.
Menu → Installer level → Installation assistant

10.3 Appliance configuration and diagnosis menu

If you have already filled and purged the heating installation and have terminated the installation assistant, but wish to set the most important system parameters again, you can also call up the "Appliance configuration" menu point.
Menu → Installer level → Appliance configuration
All of the setting options for more complex systems can be found in the diagnosis menu (**→ section 11**).
Menu → Installer level → Diagnosis menu

10.4 Using test programs

As well as the installation assistants, you can also call up the test programs for commissioning.
Menu → Installer level → Test programs

As well as the function menu (**→ section 12.3**), an electronics self test facility (**→ section 12.3.1**) and the gas family check (**→ section 12.1.5**), you will also find the test programs here.
Menu → Installer level → Test programs -> Test programs

If you activate different test programs, you can trigger special functions on the boiler.
The following four test programs are available:

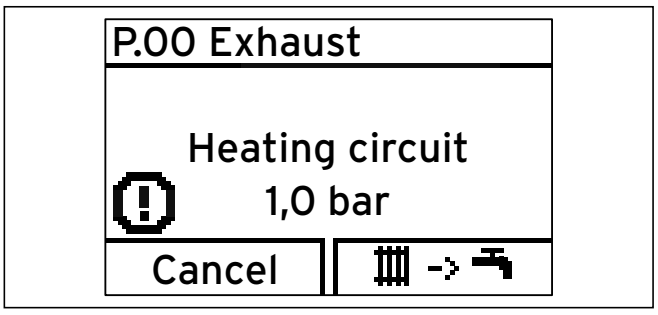
Display	Meaning
P.00 [1]	Purging test program The heating circuit and the hot water circuit are purged using the automatic air vent (the cap of the automatic air vent must be released). 1 x right selection button: Start heating circuit purging 2 x right selection button ("-> "): Start purging hot water circuit 3 x right selection button ("-> "): Restart heating circuit purging 1 x left selection button ("Cancel"): Exit purging program The internal pump is cyclically actuated. **Note:** The purge program runs 7.5 min per circuit.
P.01	Maximum load test program: The boiler is operated at maximum heat input after successful ignition.
P.02	Minimum load test program: The boiler is operated at minimum heat input after successful ignition.
P.06	Filling mode test program: The diverter valve (VUV) is moved to the mid-position. The burner and pump are switched off (to fill or drain the boiler).

10.1 Overview of the test programs

[1] Purging the heating circuit:
Diverter valve in heating position, actuation of internal pump for 9 cycles: 30 s on, 20 s off. Display: "Active heating circuit".
Purging the hot water circuit:
After the above-mentioned cycles have run or the right selection button has been pressed again: Diverter valve in the hot water position, actuation of the internal pump as above. Display: "Active hot water circuit".

If you do not press a button for more than 15 minutes. the test programs are stopped automatically. The boiler switches to normal operating mode.

To terminate the test programs, you can press the left selection button ("Cancel") at any time.



10.1 Boiler in error condition

If the boiler is in error condition, you cannot start any test programs. You can detect an error condition by the fault symbol shown in the left bottom corner of the display. You must first reset.

10.5 Preparing the heating water

Pay attention to the specifications concerning heating water preparation in (→ **section 2.5.7**).

10.6 Read off the filling pressure

The boiler is equipped with an analogue pressure gauge (→ **fig. 3.1** and **3.2**) and also has a symbolic bar display for the filling pressure of the heating installation and a digital pressure and temperature display.
You can see the pressure gauge once you have removed the front casing of the boiler.
Press the right selection button twice to read off the digital filling pressure value.

10.7 Filling and purging the heating installation

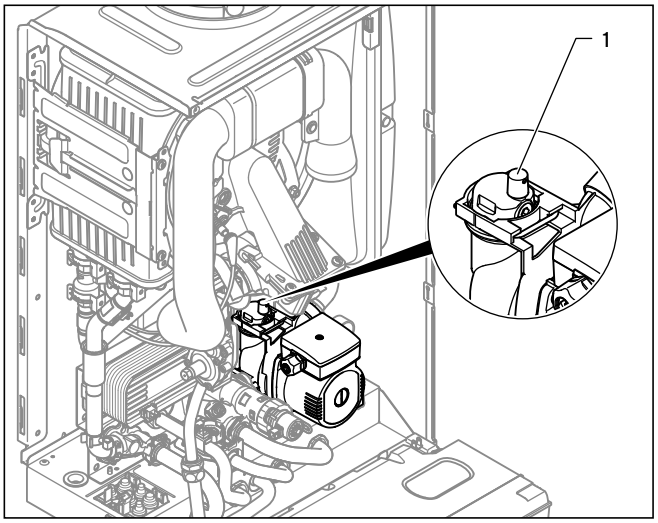
Caution.
Risk of damage caused by contaminated lines.
Foreign bodies such as welding remnants. sealing residue or dirt in the water lines can cause damage to the boiler.
➤ Flush the heating installation thoroughly prior to commissioning.

The system is filled via a customer-installed filling connection, which must be attached in a suitable position in the heating circuit. This connection must be removed again after the filling process is complete. If the local Water Authority regulations do not allow temporary connection a sealed system filler pump with break tank must be used. The heating system will not be filled automatically from the domestic hot water side. (Alternative methods of filling sealed systems are given in BS 5449). The ecoTEC plus combination boilers can be filled via the built in filling lopp under the boiler (→ **fig. 10.3**).

To ensure the correct operation of the heating installation, the indicator on the pressure gauge must point to the upper half of the grey area or in the middle of the bar graph display (marked by the dashed limit value) when the heating installation is cold. This corresponds to a filling pressure of between 0.1 MPa and 0.2 MPa (1.0 bar and 2.0 bar).
You can display the exact filling pressure (→ **section 10.6**).

If the heating installation extends over several storeys, higher filling pressures may be required to avoid air entering the heating installation.

➤ Remove the front casing from the boiler (**➞ section 4.7**).



10.2 Automatic air vent

➤ Release the cap of the automatic air vent (**1**) by up to two rotations.
➤ Open all thermostatic radiator valves.

The ecoTEC plus purges the heating circuit independently during continuous operation via the automatic air vent.

➤ Only for VUW boilers: Select test program P.06 (**➞ section 10.4**).

The diverter valve moves to the central position, the pumps do not run and the boiler does not switch to heating mode.

10.7.1 Filling the heating installation

Ensure that the filling and drainage cock on the heating installation is connected to a cold water valve as per standard.

➤ In order to fill the heating installation, first open the cold water valve.
➤ Open all thermostatic radiator valves.
➤ Check that both service valves on the boiler are open.
➤ Slowly open the stop valve on the filling line so that the water flows into the heating system.

If the water pressure in the heating system is too low, the display switches between fault message F.22 and the display of the current pressure when the boiler is switched on.

➤ Purge the lowest radiator until water flows out of the purging valve without bubbles.
➤ Purge all other radiators until the entire heating system has been filled with water. Close all purging valves.
➤ Use the display to monitor the rising filling pressure in the heating installation.
➤ Top up with water until the pressure gauge display is in the middle of the grey area and the required filling pressure appears on the display.
➤ After filling, close the stop valve at the filling line and the cold water valve.
➤ Check all connections and the entire system for leaks.

10.7.2 Purging the heating system

➤ To purge the heating installation, select test program P.00 (**➞ section 10.4**).

The boiler does not start up, the internal pump operates intermittently and, as an option, purges the heating circuit or the hot water circuit. The display shows the filling pressure of the heating installation.

➤ The filling pressure of the heating installation must not fall below 0.08 MPa (0.8 bar) when purging is in progress as, otherwise, this will not be carried out properly.

The test program P.00 runs for 7.5 minutes per circuit.
At the end of the filling procedure, the filling pressure of the heating installation should be at least 0.02 MPa (0.2 bar) above the counterpressure of the expansion vessel ($P_{Installation} \geq P_{Exp}$ + 0.02 MPa (0.2 bar)).

➤ If there is still too much air in the heating installation at the end of test program P.00, repeat the test program.
➤ Check all connections for leaks.

10.7.3 Flushing the system for the first time ("cold")

The entire heating system must be flushed through completely at least twice: once cold and once hot, in accordance with the following instructions.

➤ Check whether all thermostatic radiator valves and both service valves on the boiler are open.
➤ Connect a hose to the drain valve that is located at the lowest position in the heating system.
➤ Open the drain cocks and all the purging valves on the radiators so that the water flows quickly and completely out of the heating system and the boiler, in order to remove the contamination caused during installation out of the heating system before the boiler is started up.
➤ Close the drain cocks.

- ➤ Refill the heating system with water, as described in (**→ section 10.7**).
- ➤ Check that the expansion relief valve of the heating system is functioning correctly by turning the handle on the valve.
- ➤ Check the pressure in the heating system and top up with water if necessary.
- ➤ Close the filling valve and the cold water valve.

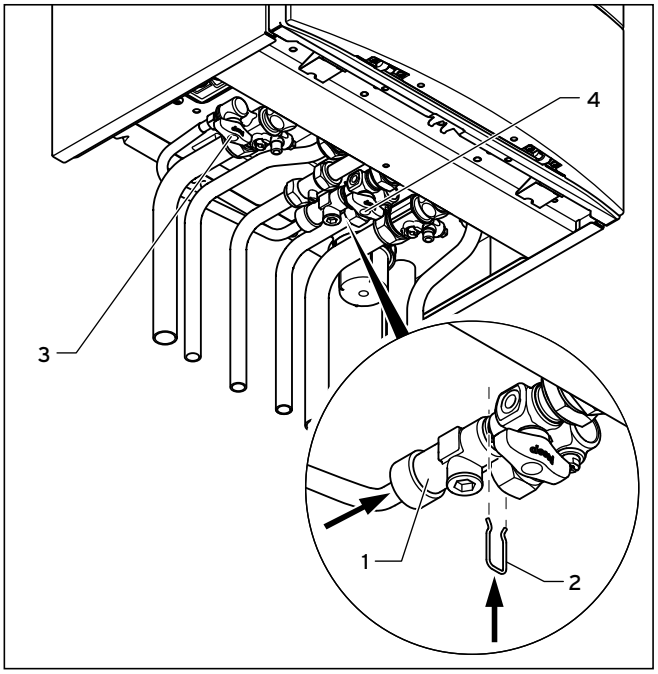
10.8 Avoiding low water pressure

To prevent damage to the heating installation caused by low water pressure, the ecoTEC plus is fitted with a water pressure sensor.
If the water pressure falls below 0.08 MPa (0.8 bar), the boiler indicates low pressure by displaying a flashing pressure value.
If the water pressure falls below 0.05 MPa (0.5 bar), the boiler switches off.
The fault message F.22 appears in the display.

➤ Top up the water and switch the boiler on again.
A flashing pressure value appears on the display until a pressure of 1.1 bar or higher has been reached.

If you notice frequent drops in pressure, then determine and eliminate the cause, i.e water leaks in the system. Failure to do so along with frequent topping up will result in system corrosion and subsequent failures.

10.8.1 Top up VUW boilers using a filling device



10.3 Filling the VUW boiler using a filling device

The VUW boilers are equipped with a filling device.
- ➤ Insert the double non-return valve (**1**) of the filling line into the cold water stop valve and secure the valve with the spring clip (**2**).
- ➤ To fill, first open the stop valve (**3**).
- ➤ Open the stop valve (**4**) so that the water flows into the heating system. Fill the heating system as described in **→ section 10.7**.
- ➤ After filling, close both stop valves and disconnect the filling device by pulling the double non-return valve from the cold water stop valve.

Both stop valves must be closed during the operation of the heating system and the filling line must be removed from the double non-return valve again.

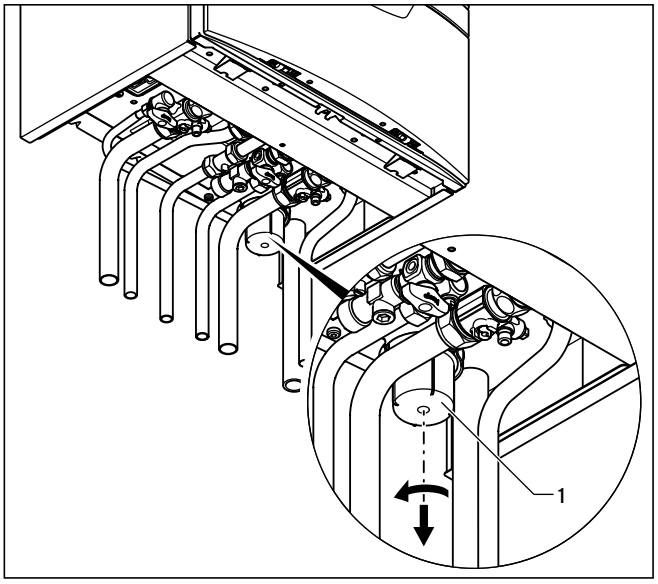
10.9 Fill and purge the hot water system

- ➤ Open the cold water stop valve on the boiler (only for VUW boilers).
- ➤ Fill the hot water system by opening all the hot water draw-off points until water comes out.

As soon as water comes out of all the hot water draw-off points, the hot water circuit is filled completely and also purged.

10.10 Filling the condensate siphon

Danger!
Risk of poisoning from escaping flue gas!
An empty or insufficiently filled condensate siphon may allow flue gas to escape into the room air.
- ➤ Fill the condensate siphon with water before starting up the boiler.

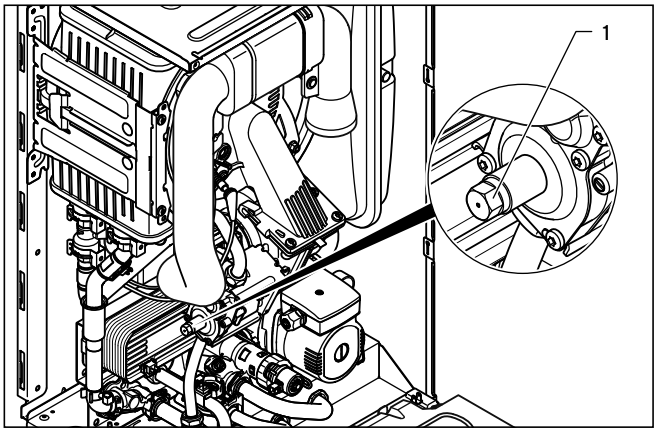


10.4 Filling the condensate siphon

- ➤ Remove the lower part (**1**) of the condensate siphon by turning the bayonet fitting anti-clockwise.
- ➤ Fill the lower section with water until about 10 mm below the upper edge.
- ➤ Re-attach the lower section to the condensate siphon.

10.11 Checking the gas setting

Caution.
Risk of damage caused by a not permissible setting.
Modifications to the gas pressure regulator on the gas valve can destroy the gas valve and cause operating faults on the boiler.
- ➤ Never modify the factory setting for the gas pressure regulator of the gas valve.



10.5 Gas pressure regulator

Gas valves with gas pressure regulators (**1**) are not installed in all boilers. There are also versions without gas pressure regulators.

10.11.1 Factory setting

Caution!
An incorrect gas group setting can cause operating faults or a reduction in the working life of the boiler.
If the boiler version does not correspond to the local gas group, there will be malfunctions or you have to change components of the boiler ahead of schedule, e. g. do not use a LPG boiler on natural gas.
- ➤ Before starting up the boiler compare the details of the gas group specified on the identification plate with the gas group supplied at the installation site.

If the boiler version corresponds to the local gas family:
- ➤ Proceed as described below.

If the boiler version does not correspond to the local gas family:
- ➤ Call Vaillant Service Solutions (0870 6060 777); Gas conversions must only be carried out by Vaillant Service Solutions.
- ➤ You must not start up the boiler yourself.

If a gas conversion to liquid gas has been carried out by Vaillant Service Solutions, the smallest possible partial load is higher than is shown in the display. The current values can be found in the technical data (**→ section 17**).

The combustion of this boiler has been checked, adjusted and preset at the factory for operation on the gas group defined on the identification plate. No measurement of the combustion is necessary to set up the boiler.

Do not adjust the gas valve.
- ➤ Ensure
  - that the boiler has been installed in accordance with these instructions,
  - the integrity of the flue system and the flue seals, as described in the **→ flue installation instructions** enclosed with this boiler, and as described below,
  - a visual check is carried out on the boiler combustion circuit and the relevant seals,
  - that any defects have been corrected at this stage.

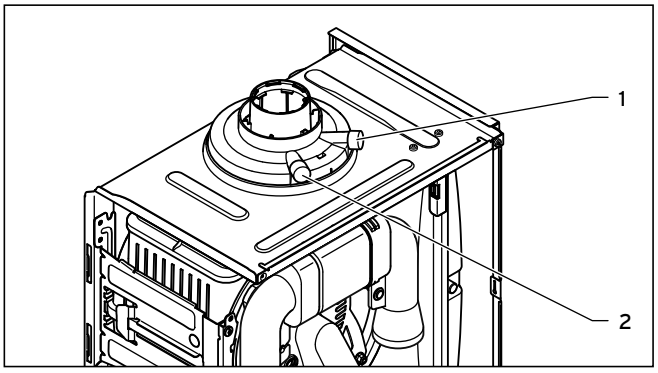
To further validate the integrity of the flue system and confirm correct operation of the boiler it is possible to conduct

flue gas and air measurements on this boiler - for details see section **→ section 10.11.2**.

Proceed to put the boiler into operation as follows:
- ➤ Check the maximum gas flow rate as detailed in **→ section 10.11.3**.
- ➤ Check the gas inlet working pressure as detailed in **→ section 10.11.4**.
- ➤ Note that you must re-measure the gas flow rate or the gas inlet working pressure, if changes were required to correct any issues found.

10.11.2 Checking for tightness of the flue gas installation and flue gas recirculation

- ➤ Check the integrity off the flue gas installation according to TB 008.
- ➤ Should the flue gas installation be longer than 2 m we strongly recommend to check the system for flue gas recirculation as described below.



10.6 Flue gas and air measure points

Legend:
1 Flue gas measure point
2 Air measure point

For checking the system for recirculation use the air measure point (**2**).
- ➤ Use the flue gas analyser.
- ➤ If you detect any CO or CO_2 in the fresh air, search for the flue gas leakage or recirculation.
- ➤ Correct the defects.
- ➤ Check again as described before, if there is any CO or CO_2 in the fresh air.
- ➤ If you cannot correct the defects you must not start up the boiler.

10.11.3 Checking the gas flow rate

The boiler is fitted with an electronic gas air system which ensures that the precise air/gas ratio is provided under all operating conditions. The gas flow rate has been set during production and does not require adjustment. With the front casing fitted check the gas flow rate of the boiler as follows:

- ➤ Start the boiler by activating the test program P.01 as described in **→ section 10.4**.
- ➤ In addition, ensure that maximum heat can be dissipated into the heating system by turning up the room thermostat.
- ➤ Alternatively, for VUW-boilers: fully open the hot water taps to ensure full flow rate through the boiler.
- ➤ Wait at least 5 minutes until the boiler has reached its operating temperature.
- ➤ Ensure that all other gas appliances in the property are turned off.
- ➤ Measure the gas flow rate at the gas meter.
- ➤ Check that the gas flow rate is as stated in **→ table 10.2**.

If the measured gas flow rate lies outside the tolerance limits specified in **→ table 10.2**, do not operate the boiler and inform the Vaillant Service Solutions (0870 6060 777).

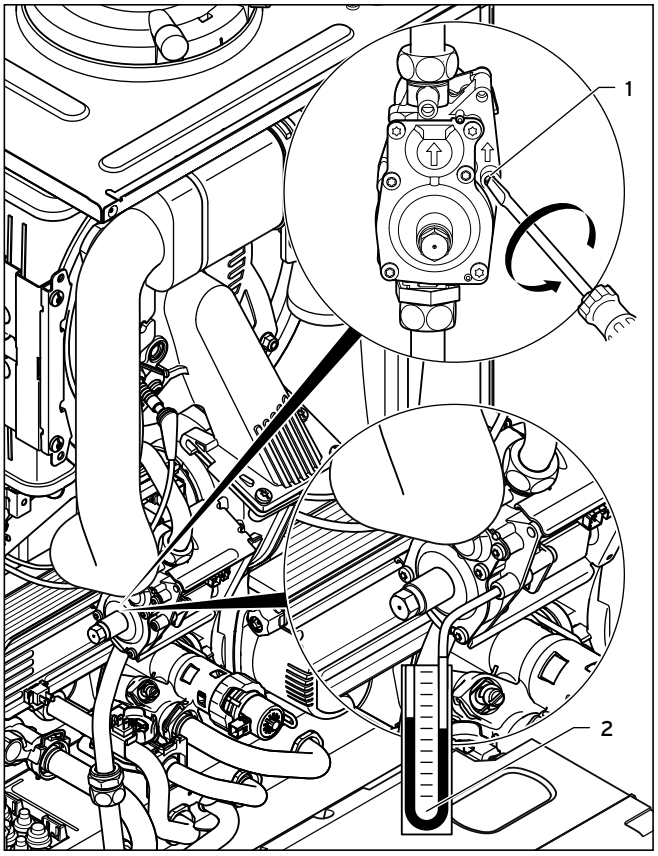
If the measured gas flow rate is within the tolerance limits shown in **→ table 10.2**, then proceed as follows:
- ➤ Take the boiler out of operation by
  - terminating test program P.01 as described in **→ section 10.4**.
  - Only for VUW-boilers: Allow the boiler to cool down by turning off water taps and allow pump overrun to operate for a minimum of two minutes.
- ➤ Record the boiler maximum gas flow rate onto the Benchmark gas boiler commissioning checklist.

Nominal net heat output in kW	Gas flow rate (as per BS EN 483)					
	Natural gas in m^3/h			Propane in kg/h		
	nominal	+ 5 %	- 10 %	nominal	+ 5 %	- 10 %
12	1.31	1.38	1.18	0.96	1.01	0.86
15	1.64	1.72	1.48	1.20	1.26	1.08
18	1.97	2.07	1.77	1.44	1.51	1.30
24	2.61	2.74	2.35	1.92	2.02	1.73
30	3.27	3.43	2.94	2.40	2.52	2.16
37	4.03	4.23	3.63	2.96	3.11	2.66
24	2.61	2.74	2.35	1.92	2.02	1.73
31	3.30	3.47	2.97	2.42	2.54	2.18
37	4.15	4.36	3.74	3.05	3.20	2.75

10.2 Gas flow rates

10.11.4 Checking the gas inlet working pressure

- ➤ Ensure that the gas inlet working pressure can be obtained with all other gas appliances in the property working.
- ➤ Remove the front casing from the boiler (**→ section 4.7**).
- ➤ Close the gas isolation valve of the boiler.



10.7 Measuring the gas inlet working pressure

- ➤ Undo the sealing screw of the measuring nipple (**1**) (lower screw) at the gas valve using a screwdriver.
- ➤ Connect a digital pressure gauge or U-tube manometer (**2**) to the measuring nipple (**1**).
- ➤ Open the gas isolation valve of the boiler.
- ➤ Start the boiler by activating the test program P.01 as described in **→ section 13.4**.
- ➤ In addition, ensure that maximum heat can be dissipated into the heating system by turning up the room thermostat.
- ➤ Alternatively, for VUW-boilers: fully open the hot water taps to ensure full flow rate through the boiler.
- ➤ With the boiler operating at full load check that the gas inlet working pressure at the reference test point (**1**) complies with the requirements of **→ table 10.3**.
- ➤ Should the pressure recorded at the reference test point in the boiler be lower than indicated (**→ table 10.3**) check if there is any blockage in the pipework or if the pipework is undersized.

If the supply pressure is out of tolerance contact your Emergency Service Provider.

If the gas inlet working pressure at the reference test point (**1**) is **not within** the permissible range and you cannot correct the failure, notify the gas supply company or the Vaillant Service Solutions (0870 6060 777) and proceed as follows:

- ➤ Take the boiler out of operation by
  - terminating test program P.01 as described in **→ section 10.4**.
  - Only for VUW-boilers: Allow the boiler to cool down by turning off water taps and allow pump overrun to operate for a minimum of two minutes.
- ➤ Close the gas isolation valve of the boiler.
- ➤ Remove the pressure gauge and retighten the sealing screw (**1**) for the measuring nipple.
- ➤ Turn on gas at the gas isolation valve.
- ➤ Make sure that there is no leakage at the sealing screw.
- ➤ Turn off gas at the gas isolation valve.
- ➤ Put the front casing back on.
- ➤ Turn off electrical supply to the boiler.
- ➤ **You must not start up the boiler.**

If the gas inlet working pressure is **within** the permissible range, proceed as follows:

- ➤ Take the boiler out of operation by
  - terminating test program P.01 as described in **→ section 10.4**.
  - Only for VUW-boilers: Allow the boiler to cool down by turning off water taps and allow pump overrun to operate for a minimum of two minutes.
- ➤ Close the gas isolation valve of the boiler.
- ➤ Remove the pressure gauge and retighten the sealing screw (**1**) for the measuring nipple.
- ➤ Open the gas isolation valve of the boiler.
- ➤ Make sure that there is no leakage at the sealing screw.
- ➤ Put the front casing back on.
- ➤ Reset boiler controls for normal operation.
- ➤ Record the boiler gas inlet working pressure (kPa resp. mbar) in the Benchmark gas boiler commissioning checklist.

Boiler	Natural gas (G20)		LPG (G31)	
	Minimum pressure at reference test point in kPa (mbar)	Maximum pressure at reference test point in kPa (mbar)	Minimum pressure at reference test point in kPa (mbar)	Maximum pressure at reference test point in kPa (mbar)
612/ 615/ 618/ 624/ 630/ 824/ 831	1,6 (16)	2,3 (23)	2,3 (23)	4,3 (43)
637/ 837	1,5 (15)	2,3 (23)	2,3 (23)	4,3 (43)

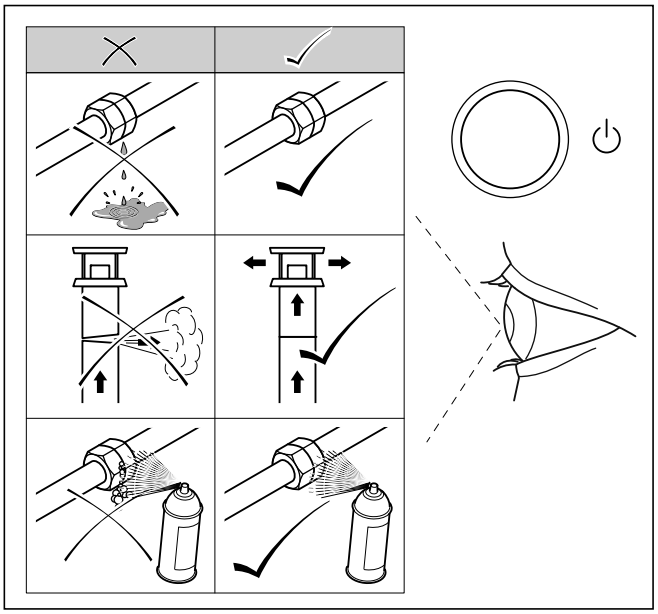
10.3 Gas inlet working pressure at the reference test point

10.12 Carrying out a full function test

- ➤ After completing the installation and the gas setting, perform a complete function check of the boiler before starting up the boiler and handing it over to the operator.

➤ Start up the boiler in accordance with the relevant operating instructions.

If you have still not successfully completed the installation assistant and subsequently confirmed this, it will be restarted when you switch on the boiler. Before continuing, complete the installation assistant (→ **section 10.2**).



10.8 Checking for leaks

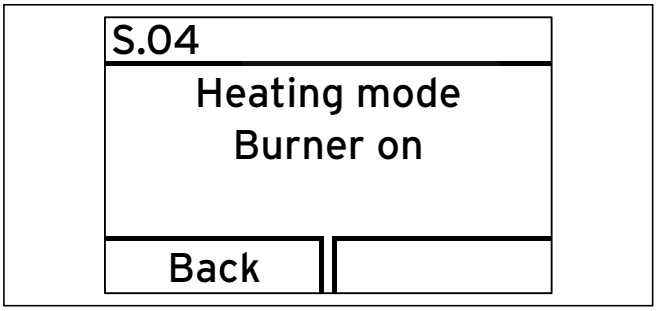
Caution!
Malfunction or shortened life expectancy!
The leak detection spray can damage the heating device.
➤ Do not spray the leak detection spray on the cover cap on the filter of the Venturis (**3,** → **fig. 3.1** and **3.2**).

➤ Check the gas supply line, the flue gas installation, the heating installation and the hot water pipes for leaks.
➤ Check the air/flue gas duct for correct installation.
➤ Make absolutely sure that the front casing is properly fitted.
➤ Check the heating mode (→ **section 10.12.1**)
➤ Check the operation of the hot water generation (→ **section 10.12.2** and **10.12.3**)

You can display the current operating condition of the boiler in the "Live monitor" on the boiler display (→ **section 13.2.1**).
Menu → Live monitor

10.12.1 Checking the heating mode

➤ Switch on the boiler.
➤ Make sure that there is a heat requirement.
➤ Activate the Live monitor (→ **section 13.2.1**).



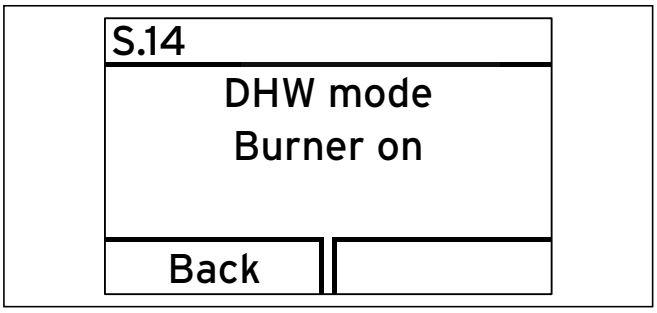
10.9 Live monitor – display during heating mode

If the boiler is operating correctly, the display will show status code "S.04". The status code displayed will also be explained by the plain text display "Heating mode: Burner on".

10.12.2 Checking hot water generation (VUW boilers only)

➤ Switch on the boiler.
➤ Open a hot water valve all the way.
➤ Activate the Live monitor (→ **section 13.2.1**).

If hot water generation is working correctly, the display shows "S.14". The displayed status code is also explained by the plain text display "DHW mode: Burner on".

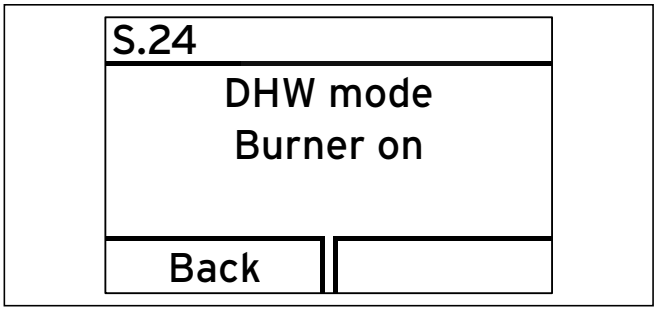


10.10 Display during hot water generation (VUW boilers only)

10.12.3 Checking hot water generation (VU boilers only)

➤ Switch on the boiler.
➤ Switch on the connected domestic hot water cylinder.
➤ Make sure that the cylinder thermostat is requesting heat.
➤ Activate the Live monitor (→ **section 13.2.1**).

If the cylinder is being charged correctly, status code "S.24" appears in the display. The status code that is displayed is also explained by the plain text display "DHW mode: Burner on".



10.11 Display during cylinder charging (VU boilers only)

- If you have connected the controller for the heating installation using a two-wire eBUS line, then set the hot water temperature at the boiler to the maximum possible temperature (→ **table 11.1**).
- Adjust the target temperature for the connected domestic hot water cylinder to the controller.

10.13 Final flush of the heating system ("hot")

- Operate the appliance until the boiler and the heating system are up to temperature.
- Check the heating system for leaks.
- Connect a hose to the drain valve located at the lowest position of the heating system.
- Shut off the boiler, open the drain valve and all purging valves on the radiators and allow the water to flow out of the heating system and the boiler quickly and fully.
- Close the drain valve.
- Fill the heating system again with water as described in → **section 10.7.3**.
- Re-fill the system until the system design pressure of 0,1 MPa (1,0 bar) is attained. (The actual reading on the digital pressure gauge should ideally be 0,05 MPa (0,5 bar) plus an additional pressure corresponding to the highest point of the system above the base of the boiler – 10 m head equals an additional 1 bar reading on the pressure gauge. The minimum pressure should not be less than 0,1 MPa (1 bar) in any installation.) If the system is to be treated with an inhibitor it should be applied at this stage in accordance with the manufacturer's instructions. Further information can be obtained from Sentinel, Betz Dearborn Ltd., Tel: 0151 420 9595, or Fernox, Alpha-Fry technologies. Tel: 0870 8700362.
- Refit the boiler casing (→ **section 4.7**).
- Attach the bottom cover to the boiler by sliding the front edge of the cover into the lip at the bottom front edge of the appliance chassis.
- Carefully push the rear of the bottom cover upwards until the spring retaining clips engage at the side of the appliance. It may be necessary to adapt the bottom cover by removing the easy break sections.

11 Adapting the boiler to the heating installation

The installation assistant is started when the boiler is switched on for the first time (**→ section 10.2**).

If you have already filled the heating installation and terminated the installation assistant, but wish to set the most important system parameters again, you can also call up the "Appliance configuration" menu point.
Menu → Installer level → Appliance configuration

All of the settings for more complex systems can be found in the diagnosis menu.
Menu → Installer level → Diagnosis menu

11.1 Diagnosis codes – Overview

Menu → Installer level → Diagnosis menu

With the use of the parameters that are marked as adjustable in **→ table 11.1**, you can adapt the boiler to the heating installation and the needs of the customer:

You can enter your settings in the last column after setting the system-specific parameters.

- ➤ Press the minus button [−] or the plus button [+] to switch between the displayed diagnosis codes.

With modifiable parameters:

- ➤ Press the right selection button [▭] ("Selection") to select the parameter to make a change.
- ➤ Press the minus button [−] or the plus button [+] to change the current setting.
- ➤ Press the right selection button [▭] ("Ok") to confirm the change.

The change is saved.

Code	Parameters	Adjustable values	Factory setting	Your own setting
D.000	Heating partial load	Adjustable heating partial load in kW Auto: Boiler automatically adjusts max. partial load to current system demand	Auto	
D.001	Overrun time of internal pump for heating mode	1 - 60 min	5 min	
D.002	Max. burner anti-cycling time heating at 20 °C flow temperature	2 - 60 min	20 min	
D.003	Outlet temp. actual value	In °C		Not adjustable
D.004	Measured value of hot water sensor	In °C		Not adjustable
D.005	Flow temperature target value (or return target value)	In °C, max. of the value set in d.71, limited by an eBUS controller if connected)		Not adjustable
D.006	Hot water temperature target value (VUW boilers only)	35 to 65 °C		Not adjustable
D.007	Warm start temperature target value (only with VUW boilers) Cylinder temperature target value (only with VU boilers)	40 to 65 °C 15 °C frost protection, then 40 to 70 °C; (max. temperature can be adjusted under D.020)		Not adjustable
D.008	Room thermostat at terminal RT	Room thermostat open (no heat requirement) Room thermostat closed (heat requirement)		Not adjustable
D.009	Target value from external eBus controller	In °C		Not adjustable
D.010	Status of internal pump	On, Off		Not adjustable
D.011	Status of external heating pump	On, Off		Not adjustable
D.012	Status of cylinder charge pump	On, Off		Not adjustable
D.013	Status of hot water circulation pump	On, Off		Not adjustable
D.014	Target pump speed (high-efficiency pump)	Not relevant		Not adjustable
D.015	Actual pump speed (high-efficiency pump)	Not relevant		Not adjustable
D.016	Room thermostat 24 V DC open/closed	Heating mode Off/On		Not adjustable
D.017	Heating flow/return regulation changeover	Control type: flow, return	Flow	
D.018	Pump operating mode setting	Comfort (continuously operating pump) Eco (intermittently operating pump)	Eco	
D.019	Operating mode of 2-stage pump	Setting for operating mode of 2-stage pump: **0 =** Burner operation = stage 2, Flow/overrun = stage 1; **1 =** Heating + Overrun = stage 1, Hot water = stage 2, **2 =** Like 1, but rotational speed during heating mode depending on heating partial load, **3 =**always stage 2 **4 =** Rotational speed during heating mode depending on heating partial load, otherwise always stage 1	2	
D.020	Max. setting for cylinder target value	Setting range: 50 °C - 70 °C (actoSTOR 65 °C)	65 °C	
D.022	Hot water requirement via C1/C2, impeller or APC	On, Off		Not adjustable
D.023	Summer/winter operating mode (heating on/off)	Heating on, heating off (summer mode)		Not adjustable
D.025	Hot water generation enabled by eBUS controller	On, Off		Not adjustable

11.1 Diagnosis codes

Code	Parameters	Adjustable values	Factory setting	Your own setting
D.026	Auxiliary relay control	Circulation pump External pump Cylinder charging pump Extractor hood External solenoid valve External fault message Solar pump (not active) eBUS remote control (not active) Legionella protection pump (not active) Solar valve (not active)	External pump	
D.027	Switching of relay 1 on the "2 in 7" multi-functional module VR 40	Circulation pump External pump Cylinder charging pump Extractor hood External solenoid valve External fault message Solar pump (not active) eBUS remote control (not active) Legionella protection pump (not active) Solar valve (not active)	External pump	
D.028	Switching of relay 2 on the "2 in 7" multi-functional module VR 40	Circulation pump External pump Cylinder charging pump Extractor hood External solenoid valve External fault message Solar pump (not active) Remote control eBUS (not active) Legionella protection pump (not active) Solar valve (not active)	External pump	
D.033	Fan speed target value	In rpm		Not adjustable
D.034	Fan speed actual value	In rpm		Not adjustable
D.035	Position of the diverter valve	Heating mode Parallel operation DHW mode		Not adjustable
D.036	Hot water flow quantity (impeller sensor)	In l/min		Not adjustable
D.039	Solar feed temperature	Actual value in °C		Not adjustable
D.040	Flow temperature	Actual value in °C		Not adjustable
D.041	Return temperature	Actual value in °C		Not adjustable
D.044	Digitised ionisation value	Display range 0 to 1020, > 800 no flame < 400 good flame		Not adjustable
D.046	Pump type	Disable via relay Disable via PWM	Disable via relay	
D.047	Outside temperature (with weather-controlled Vaillant controller)	Actual value in °C		Not adjustable
D.050	Offset for minimum speed	In rpm, setting range: 0 to 3000	Nominal value set in factory	
D.051	Offset for maximum speed	In rpm, setting range: -990 to 0	Nominal value set in factory	
D.058	Activation of solar post-heating for VUW boilers; Switch hot water mode	Solar post-heating mode deactivated DHW activation target value minimum 60 °C	Solar post-heating mode deactivated	

11.1 Diagnosis codes (continued)

Code	Parameter	Adjustable values	Factory setting	Your own setting
D.060	Number of temperature limiter shut-downs	Number of shutdowns		Not adjustable
D.061	Number of ignition device cutoffs	Number of unsuccessful ignitions in the last attempt		Not adjustable
D.064	Average ignition time	In seconds		Not adjustable
D.065	Maximum ignition time	In seconds		Not adjustable
D.067	Remaining burner anti-cycling time	In minutes		Not adjustable
D.068	Unsuccessful ignitions at 1st attempt	Number of unsuccessful ignitions		Not adjustable
D.069	Unsuccessful ignitions at 2nd attempt	Number of unsuccessful ignitions		Not adjustable
D.070	Setting diverter valve position	Normal operating mode Mid-position (parallel operation) Continuous heating adjustment	Normal operating mode	
D.071	Target value maximum heating flow temperature	40 to 80 °C	75 °C	
D.072	Internal pump overrun after cylinder charging	Adjustable from 0 - 10 minutes in increments of 1 minute	2 mins	
D.073	Warm start target offset	Adjustable from -15 K to 5 K	0	
D.075	Max. charging time for domestic hot water cylinder without independent control system	20 - 90 min	45 mins	
D.076	Device specific number	1 = VU 612 3 = VU 615 4 = VU 618 9 = VU 624 14 = VU 630 20 = VU 637 6 = VUW 824 10 = VUW 831 17 = VUW 837		Not adjustable
D.077	Limit on cylinder charging output in kW	Limit on cylinder charging output in kW		
D.078	Limit on cylinder charging temperature in °C	55 °C - 80 °C Note: The chosen value must be at least 15 K or 15 °C above the set cylinder target value.	75 °C	
D.080	Operating hours, heating	In hours (h)		Not adjustable
D.081	Operating hours, hot water generation	In hours (h)		Not adjustable
D.082	Number of burner start-ups in heating mode	Number of start-ups		Not adjustable
D.083	Number of burner start-ups in hot water mode	Number of start-ups		Not adjustable
D.084	Maintenance indicator: Number of hours until the next maintenance	Setting range: 0 to 3000 hrs and "---" for deactivated	"---"	
D.088	Start delay for hot water draw-off detection via impeller (VUW boilers only)	1.5 l/min and no delay, 3.7 l/min and 2 s delay	1.5 l/min and no delay	
D.090	Status of digital controller	recognised, not recognised		Not adjustable

11.1 Diagnosis codes (continued)

Code	Parameter	Adjustable values	Factory setting	Your own setting
D.091	Status DCF with external sensor connected	No reception Reception Synchronised Valid		Not adjustable
D.093	Setting of device specific number (DSN)	Setting range: 0 to 99		
D.094	Delete fault history	Delete fault list		
D.095	Software version of PeBUS components	PCB (BMU) Display(AI) actoSTOR(APC) HBI/VR34		Not adjustable
D.096	Factory setting	Reset all adjustable parameters to factory setting		
D.098	Value of coding resistors for gas group and output range	Display xx.yy xx = Coding resistor 1 in cable harness for output range: 08 = VU 612, VU 615, VU 618, VUW 824 09 = VU 624, VUW 831 10 = VU 630 11 = VU 637, VUW 837 yy = Coding resistor 2 on PCB for gas group: 02 = P-Gas 03 = H-Gas		Not adjustable

11.1 Diagnosis codes (continued)

11.1.1 Setting the heating partial load

The heating partial load of the Vaillant ecoTEC plus boiler is factory set to "auto". This means that the boiler independently determines the optimum heating output depending on the current heat demand of the system. A setting is normally no longer required. If you still want to set a fixed maximum heating partial load, you can set a value under diagnosis code "D.000", which equates to the boiler output in kW.

11.1.2 Setting pump overrun time and pump operating mode

The pump overrun time for the heating mode is set at the factory to a value of 5 minutes. You can set the pump overrun time under diagnosis code "D.001" within the range of 1 minute to 60 minutes. You can set a different pump operating mode under diagnosis code "D.018". Here you have the choice between Eco and Comfort.

Comfort (continuously operating pump)
The internal pump is switched on when the heating flow temperature is not at "Heating off"(**→ Operating instructions)** and the heating requirement is enabled via an external controller.

Eco (intermittently operating pump)
Pump operating mode Eco is the factory setting. This pump operating mode is useful for removing residual heat after hot water generation when the heat demand is extremely low and large temperature spreads exist between the hot water generation and heating mode target values. This prevents living rooms from being under-supplied. If there is a heat demand, the pump is switched on every 25 minutes for 5 minutes once the overrun time has elapsed.

11.1.3 Setting the maximum flow temperature

The maximum flow temperature for the heating is set at the factory to 75 °C. This can be set to a value in the range of 40 °C to 80 °C under diagnosis code "D.071".

11.1.4 Setting the return flow temperature control

If the boiler is connected to an underfloor heating system, the temperature control can be changed from flow temperature regulation (factory setting) to return flow temperature control under diagnosis code "D.017".

11.1.5 Burner anti-cycling time

Setting the burner anti-cycling time
To prevent frequent switching on and off of the burner and therefore energy loss, an electronic restart lockout is activated for a specific period each time the burner is switched off. You can adjust the burner anti-cycling time to the conditions of the heating installation.
The burner anti-cycling time is only activated for the heating mode.
Hot water handling during a burner anti-cycling time does not affect the timer.
You can set the maximum burner anti-cycling time at installer level under diagnosis code "D.002" within the range 2 minutes to 60 minutes (factory setting: 20 min).
The effective burner anti-cycling time depends on the current target flow temperature and the maximum burner anti-cycling time set.

The effective burner anti-cycling times with respect to the target flow temperature and the maximum set burner anti-cycling time can be found in the following table.

The remaining burner anti-cycling time following a regular shutdown in heating mode can be called up under diagnosis code "d.067".

T_{Feed} (target) [°C]	Set maximum burner anti-cycling time [min]												
	1	5	10	15	20	25	30	35	40	45	50	55	60
20	2.0	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0	55.0	60.0
25	2.0	4.5	9.2	14.0	18.5	23.0	27.5	32.0	36.5	41.0	45.0	50.0	54.5
30	2.0	4.0	8.5	12.5	16.5	20.5	25.0	29.0	33.0	37.0	41.0	45.0	49.5
35	2.0	4.0	7.5	11.0	15.0	18.5	22.0	25.5	29.5	33.0	36.5	40.5	44.0
40	2.0	3.5	6.5	10.0	13.0	16.5	19.5	22.5	26.0	29.0	32.0	35.5	38.5
45	2.0	3.0	6.0	8.5	11.5	14.0	17.0	19.5	22.5	25.0	27.5	30.5	33.0
50	2.0	3.0	5.0	7.5	9.5	12.0	14.0	16.5	18.5	21.0	23.5	25.5	28.0
55	2.0	2.5	4.5	6.0	8.0	10.0	11.5	13.5	15.0	17.0	19.0	20.5	22.5
60	2.0	2.0	3.5	5.0	6.0	7.5	9.0	10.5	11.5	13.0	14.5	15.5	17.0
65	2.0	1.5	2.5	3.5	4.5	5.5	6.5	7.0	8.0	9.0	10.0	11.0	11.5
70	2.0	1.5	2.0	2.5	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5
75	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

11.2 Effective burner anti-cycling times

Reset remaining burner anti-cycling time
You have two options to reset the remaining burner anti-cycling time:

1st option
Menu → Reset burner anti-cycling time
The current burner anti-cycling time appears in the display.
➤ Confirm the reset of the burner anti-cycling time by pressing the right selection button ⊡ ("Select").

2nd option
➤ Press the fault clearance key (→ **Operating instructions**).

11.1.6 Setting the maintenance interval

You can define maintenance intervals for the ecoTEC plus. Using this function, the message that the boiler must be serviced appears in the display after a defined, configurable number of burner operating hours.
After the expiry of the set burner operating hours, the maintenance symbol 🔧 (open-end spanner) appears next to the current flow temperature. The display on the eBUS controller (accessory) shows the information "Maintenance" "MAIN".

Heat demand	Number of persons	Burner operating hours until the next inspection/service (depending on the system type)
5.0 kW	1 - 2 2 - 3	1,050 h 1,150 h
10.0 kW	1 - 2 2 - 3	1,500 h 1,600 h
15.0 kW	2 - 3 3 - 4	1,800 h 1,900 h
20.0 kW	3 - 4 4 - 5	2,600 h 2,700 h
25.0 kW	3 - 4 4 - 6	2,800 h 2,900 h
> 27.0 kW	3 - 4 4 - 6	3,000 h 3,000 h

11.3 Guideline values for operating hours

➤ Set the operating hours until the next service using diagnosis code "d.084".

Guideline values for the setting can be found in → **table 11.3**. The values stated correspond to an average boiler operating time of one year.
You can set the operating hours in increments of ten from 0 to 3,000 h.

If you do not enter a figure under diagnosis code "D.084" but instead enter the symbol "–", then the "Maintenance display" function is not active.

On completion of the set operating hours, you must set the maintenance interval again in diagnosis mode.

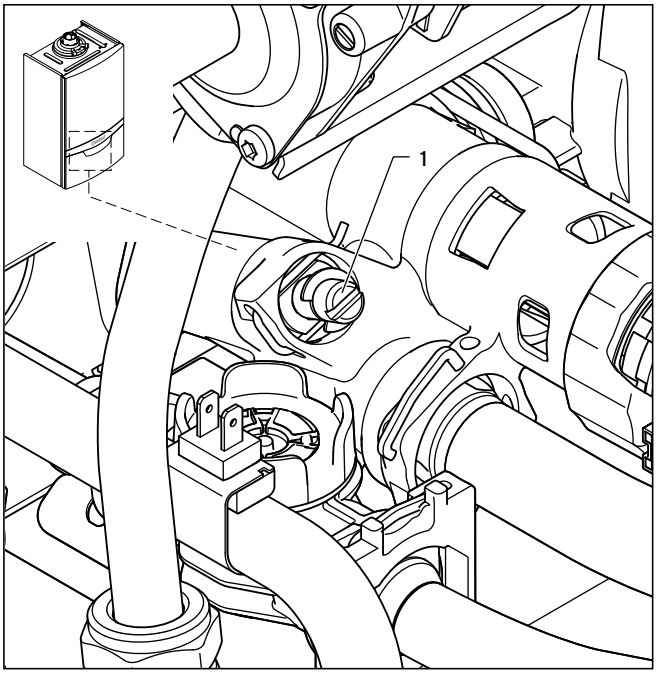
11.1.7 Setting the pump output

The ecoTEC plus boiler is equipped with a 2-stage pump. The output of the two-stage pump can be adjusted to the requirements of the heating installation.
➤ If necessary, change the setting of the pump speed according to the operating mode under diagnostic point "D.019" (Setting options → **table 11.1**).

D.019 Pump operating mode of 2-stage pump, settings:
0 Burner mode stage 2, pump flow/overrun stage 1
1 Heating mode and pump flow/overrun stage 1, DHW mode stage 2
2 Automatic heating mode, pump flow/overrun stage 1, DHW mode, stage 2
3 Stage 2
4 Rotational speed during heating mode depending on heating partial load, otherwise always stage 1

11.1.8 Setting the by-pass valve

The boilers have a by-pass valve.
The pressure is adjustable in the range between 17.0 MPa (170 mbar) and 35.0 MPa (350 mbar). Approx. 25.0 MPa (250 mbar) is pre-set (mid-position). The pressure changes by approx. 1.0 MPa (10 mbar) each time the adjusting screw is rotated. By turning right, the pressure increases and turning left decreases it.



11.1 Adjusting the by-pass valve

➤ Regulate the pressure using the setting screw (**1**).

Position of the setting screw	Pressure in MPa (mbar)	Notes/application
Right-hand stop (turned all the way down)	35.0 (350)	If the radiators do not get properly hot in the factory setting. Note: In this case, you must set the pump to the maximum stage.
Mid-position (5 turns to the left)	25.0 (250)	Factory setting
5 further turns to the left from the mid-position	17.0 (170)	If noises in the radiators or radiator valves are produced

11.4 Setting value for the by-pass valve (feed head)

11.2 Handing over the boiler to the operator

Danger!
Risk of poisoning and burns caused by escaping hot flue gas!
Hot flue gas can escape and cause poisoning and burns if the boiler is operated with an incompletely mounted or open air/flue gas duct or if the boiler is operated with internal leaks with the front casing open.

- ➤ Operate the boiler
  - for commissioning
  - for testing purposes
  - in continuous operation

  only when the front casing is fitted and closed and the air/flue gas duct is completely mounted.
- ➤ Exclusively for test purposes such as gas working pressure testing the boiler may be operated with the front casing removed for short durations ONLY but must have a completely mounted air/flue gas duct.

- ➤ After completing the installation, stick the 835593 sticker in the user's language to the front of the unit. The sticker is delivered with the boiler.

You must brief the operator of the boiler on the handling and function of the ecoTEC plus.

- ➤ Explain the importance of regular maintenance by a competent specialist company to the operator.
  It is strongly recommended that a maintenance contract be taken out to ensure regular maintenance. Important information is available from Vaillant Service Solutions (0870 6060 777).
- ➤ Fully complete the Benchmark gas boiler commissioning checklist which will be found at the back of this manual.
  If this boiler is not installed and commissioned in accordance with manufacturer's instructions, this may void the guarantee (Note: Your legal rights remain unaffected by this.)
- ➤ Handover the boiler to the operator.
- ➤ Explain the basic operation of the heating installation to the operator.
- ➤ Provide the operator with all relevant instructions and boiler documentation.
- ➤ Go through the operating instructions with the operator
- ➤ Reply to his questions if necessary.
- ➤ Make the operator aware of the need to keep the instructions in a handy location near the boiler, but not in or on the boiler.
- ➤ Draw special attention to the safety instructions, which the operator must follow.
- ➤ Instruct the operator that no changes or adaptations must be made to the flue system or combustion air supply. These must both terminate outside of the building and be constructed only from approved components.
- ➤ Explain to the operator how he should monitor the water level/filling pressure of the system.
- ➤ Explain to the operator which measures are required to top up and purge the heating installation if required.
- ➤ Explain to the operator how to correctly set the temperatures, the controllers and the thermostatic radiator valves (economically).
- ➤ Complete and sign off the Benchmark commissioning check list.
- ➤ Complete and sign off the guarantee documentation.

12 Inspection and maintenance

After servicing, complete the relevant Service Record section of the Benchmark Checklist located on the inside back pages of this document.

12.1 Inspection and maintenance intervals

Danger!
Risk of injury and risk of damage to property due to neglected inspection and maintenance!
Neglected inspection and maintenance works or not observing the stated inspection and maintenance intervals can interfere with the operational safety of the boiler and can result in damage to property and to persons.
- ➤ Point out to the operator that he must observe the demanded inspection and maintenance intervals as a minimum.
- ➤ Carry out proper regular inspections once a year.
- ➤ Carry out regular maintenance as dictated by findings during the inspection process.

Danger!
Danger of life and limb due to improper inspection/maintenance!
Inspections/Maintenance work carried out improperly can result in leakages and explosion.
- ➤ The boiler may only be inspected/maintained by a competent person.

All service work must be carried out by a competent person in accordance with the Gas safety, installation and use regulations. In the UK this is considered to be a person approved at the time by the Health and Safety Executive.

In addition BS 6798: 2009 "Specification for installation and maintenance of gas-fired boilers of rated input not exceeding 70 kW net" advises that:
- The person carrying out a combustion measurement must be assessed as competent in the use of a flue gas analyser and the interpretation of the results.
- The flue gas analyser used must be one meeting the requirements of BS 7927 or BS-EN50379-3 and be calibrated in accordance with the analyser manufacturers' requirements.
- Competence can be demonstrated by satisfactory completion of the relevant ACS standard assessment, which covers the use of electronic portable flue gas analysers' in accordance with BS 7967, parts 1 to 4.
- The flue gas analyser is set to the correct fuel setting.

We recommend the conclusion of an inspection and maintenance contract with an approved company or installer.
The inspection serves to determine the actual condition of the respective boiler and compare it with the specified condition. This is done by measuring, checking and observing. Maintenance is required in order to eliminate any deviations of the actual condition from the specified condition.

This normally is done by cleaning, adjustment and, if necessary, replacing individual components that are subject to wear.

In any case, regular servicing in line with column 2 in **→ table 12.3** must be carried out to ensure continued efficient and reliable operation of the boiler.

You must carry out an annual inspection of the Vaillant ecoTEC.
The annual inspection can be effectively performed without removing components by requesting data from the DIA system, carrying out the simple visual checks indicated in **→ table 12.3** and performing a flue gas measurement.
The maintenance intervals and their scope are determined by the heating engineer based on the condition of the boiler found during the inspection.
All inspection and maintenance work should be performed in the order specified in **→ table 12.3**.

Danger!
Risk of poisoning and burns caused by escaping hot flue gas!
Hot flue gas can escape and cause poisoning and burning if the boiler is operated with an incompletely mounted or open air/flue gas duct or if the boiler is operated with internal leaks with the front casing open.
- ➤ Operate the boiler
  - for commissioning
  - for testing purposes
  - in continuous operation

  only when the front casing is fitted and closed and the air/flue gas duct is completely mounted.
- ➤ Exclusively for test purposes such as gas working pressure testing the boiler may be operated with the front casing removed for short durations ONLY but must have a completely mounted air/flue gas duct.

12.1.1 General inspection and maintenance instructions

To ensure the faultless operation, long term availability of all functions and long working life of your Vaillant boiler and to prevent modifications to the approved series status only genuine Vaillant spare parts must be used when carrying out inspection, maintenance and repair work.
For an overview of the available original Vaillant spare parts, contact the Vaillant sales office on 0870 6060 777.
During any inspection and maintenance or after change of parts of the combustion circuit, the following must be checked:

- The boiler has been installed in accordance with the relevant installation instructions.
- The integrity of the flue gas installation and flue seals is in accordance with the relevant flue installation instructions enclosed.
- Visual, the integrity of the boiler combustion circuit and relevant seals (paying particular attention to the burner door seal).
- The gas inlet working pressure at maximum rate as described in → section 10.11.4.
- The gas flow rates as described in → section 10.11.3.
- Correctness of electrical, water and gas connections.
- Correctness of the water pressure.
- The condition of the whole system, in particular the condition of radiator valves, evidence of leakage from the heating system and dripping taps.

➤ Correct any faults before proceeding.

12.1.2 Safety instructions

Danger!
Danger of life and limb by electric shock!
The supply terminals of the boiler are under mains voltage even if the boiler main switch is off.
➤ Don't touch the supply terminals.
➤ Protect the electronic box from any water or spray.
➤ Before working on the boiler, turn off the power and secure against restart.

If it is necessary to keep the electricity to the boiler switched on for certain inspection and maintenance, this is indicated in the description of the maintenance task.

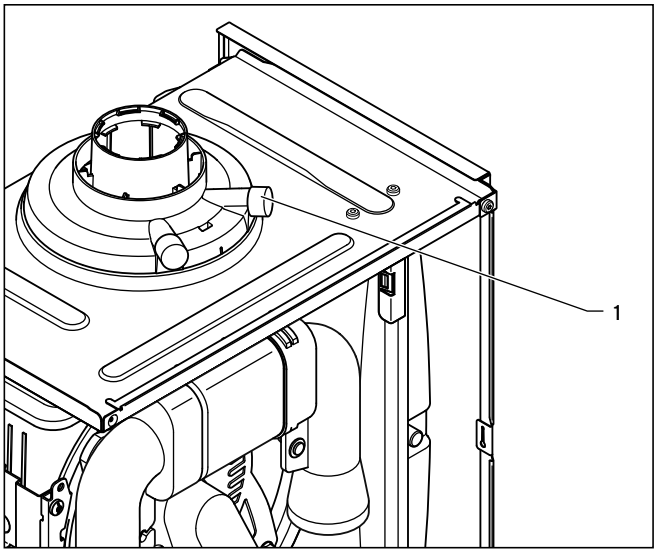
Always perform the following steps **prior** to inspection or maintenance work:
➤ Switch off the main switch.
➤ Disconnect the boiler from the power mains by
  – disconnecting the mains plug or
  – de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
➤ Further check for electrical isolation of the appliance by use of a test meter.
➤ Close the gas isolation valve.
➤ Close the service valves in the heating flow and return.
➤ Remove the front casing from the boiler.
➤ When removing any water carrying components ensure that water is kept away from all electrical components.

Always perform the following steps **after** performing any inspection or maintenance work:
➤ Always use new seals and O-rings when parts are replaced.
➤ Open the service valves in the heating flow and return.
➤ Open the cold water stop valve if necessary.
➤ Reconnect the boiler to the power mains.
➤ Switch on the boiler using the on/off switch.
➤ Fill the heating circuit of the boiler to a pressure of between 0,1 and 0,2 MPa (1,0 and 2,0 bar) if required.
➤ If you have topped up with water, purge the heating installation using test program P.00 (**→ section 10.7.2**).
➤ Open the gas isolation valve.
➤ Check the boiler for gas and water leaks.
➤ Replace the front casing to the boiler (**→ section 4.7**).
➤ If you have worked on the gas route, carry out a gas family check (**→ section 12.1.5**).
➤ Carry out a functional check of the boiler (**→ section 10.12**).
➤ Always check earth continuity, polarity and resistance to earth with a multimeter after any service work and after replacing any electrical component.
➤ If necessary, refill and re-purge the heating installation.
➤ Complete the benchmark gas boiler commissioning service record on the back pages of these instructions.

12.1.3 Checking the CO/CO_2 ratio and the CO_2 concentration

Danger!
Danger of explosion, fire or poisoning caused by incorrect flue gas value adjustment.
Safe combustion can only be verified by measuring CO/CO_2 ratio.
➤ Make sure that the CO/CO_2 ratio does not exceed the value shown in → table 12.1.

Checking/adjustment of the CO2 concentration is required in the following instances:
- replacement of gas valve,
- conversion to or from Natural Gas/LPG
- or if an incorrect combustion is suspected.



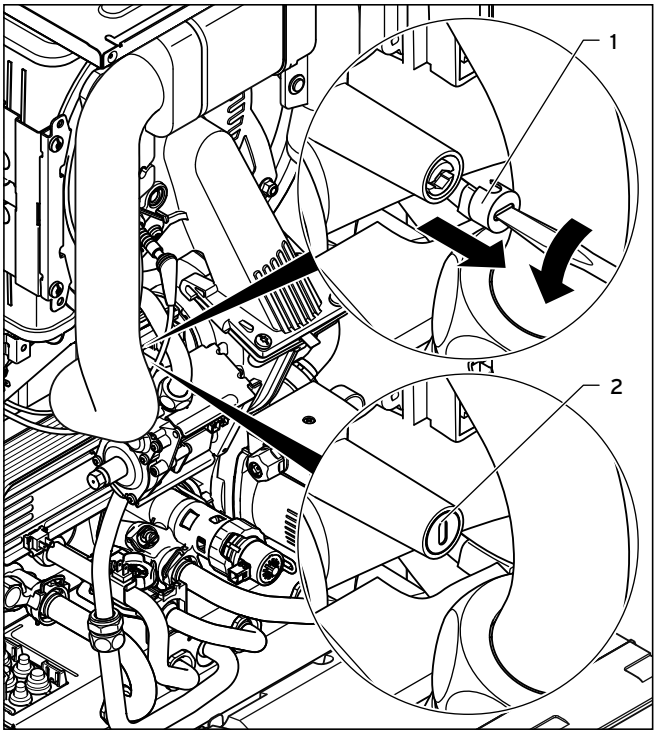
12.1 Measuring the CO_2 concentration

The boiler is fitted with a flue gas analysis point (**1**). A suitable flue gas analyser can be connected to this point to establish the combustion performance of the boiler.

- ➤ Remove the front casing (**→ section 4.7**).
- ➤ Start the testing program P.01 (**→ section 10.4**).
- ➤ Wait at least 5 minutes until the boiler reaches its operating temperature.
- ➤ Measure the CO_2 concentration at the flue gas analysis point (**1**). Compare the measured value with the corresponding value in **→ table 12.1**.
- ➤ If all these points are as required, proceed as described in **→ section 12.2**.
- ➤ If one of the flue gas values is greater than the acceptable values in **→ table 12.1**, then proceed as described in the following **→ section 12.1.4**.

12.1.4 Adjusting the CO_2 concentration (or the air ratio)

Danger!
Increased risk of poisoning due to incorrect settings!
If one of the flue gas values is greater than the acceptable values in **→ table 12.1** then:
- ➤ Check the integrity of the complete flue gas installation.
- ➤ Check the integrity of the combustion circuit seals.
- ➤ Check the gas inlet working pressure.
- ➤ Check the gas flow rate.



12.2 Removing the covering cap for the air ratio setting adjusting screw (gas setting) and making the air ratio setting

If the flue gas value needs to be adjusted, proceed as follows.
The adjusting screw for making the air ratio setting is located beneath a covering cap (**1**), which is easy to unscrew.
- ➤ To do this, push a small slotted screwdriver through the covering cap at the mark and unscrew it.
- ➤ Set the relevant CO_2 value (value with removed front casing **→ table 12.1**) by turning the screw (**2**). To do this, use a small slotted screwdriver or a 2.5 mm Allen key.
- – Turn to the left: higher CO_2 concentration,
- – Turn to the right: lower CO_2 concentration.

Natural gas: Only perform the adjustment in increments of 1 turn and wait approximately 1 minute after each adjustment until the value stabilises.

Liquid gas: Only perform the adjustment in small increments (approximately 1/2 turns), and wait approximately 1 minute after each adjustment until the value stabilises.

- ➤ Press the "Cancel" selection button once the settings have been adjusted.
- ➤ When the adjusting work is complete, screw the covering cap back in again.
- ➤ Put the front casing back on (**→ section 4.7**).

Settings	Unit	Natural gas (H)	Propane
CO_2 after 5 minutes full load mode with boiler front casing fitted	Vol.-%	7.8 – 10.2	9.7 – 10.7
CO_2 after 5 minutes full load mode with boiler front casing removed	Vol.-%	7.6 – 10.0	9.5 – 10.5
Set for Wobbe index Ws	kWh/m^3	15	22.5
CO value with full load	ppm	< 250	< 250
CO/CO_2		< 0.0031	< 0.0026

12.1 Factory gas setting

Danger!
Risk to life due to poisoning!
CO is an extremely toxic gas. Risk to life due to excessive CO concentrations.
- ➤ If you are not able to adjust the boiler correctly and the flue gas values remain higher than allowed in **→ table 12.1**, call the Vaillant Service Solutions (0870 6060 777).
- ➤ Do not start up the boiler!

12.1.5 Performing the gas family check

Danger!
Risk to life due to poisoning!
CO is an extremely toxic gas. Risk to life due to excessive CO concentrations. Fault codes F.92 or F.93 may occur as result of the gas family check.
- ➤ Correct the failure unconditionally before starting up the boiler for continuous operation.

Menu → Installer level → Test programs →Gas family check
The gas family check checks the boiler setting with regard to combustion quality.
- ➤ Perform the gas family check:
  - as part of regular boiler maintenance
  - after replacing components or working on the gas route.

No CO/CO_2 or CO_2 measurement is possible during the gas family check.

Result	Meaning	Response
F.92 Coding resistor fault	The coding resistor on the PCB does not match the entered gas family	➤ Check the coding resistor, repeat the gas family check and enter the correct gas family.
"successful"	Combustion quality is good. Appliance configuration matches the specified gas family.	None
"Warning"	Combustion quality insufficient. CO_2 value and CO/CO_2 ratio are incorrect.	➤ Start test program P.01 and adjust the CO_2 value with the adjusting screw in the venturi **→ section 12.1.4**. ➤ If the correct CO_2 value cannot be set: Check the gas restrictor for correctness (yellow: H-gas, grey: liquid gas) and damage. ➤ Repeat gas family check.
F.93 Gas group fault	Combustion quality outside the permitted range	➤ Damaged or incorrect gas restrictor (yellow: H-gas, grey: liquid gas), wrong gas group, internal pressure measuring point in venturi blocked (do not use lubricants on O-ring in venturi.), recirculation, faulty seal. ➤ Resetting the boiler. ➤ Set correct CO_2 value using test program P.01 (adjusting screw in venturi) **→ section 12.1.4**. ➤ Repeat the gas family check.

12.2 Results and measures after gas family check

12.2 Inspection and maintenance work steps

No.	Activity	Column 1 Inspection must be carried out each year	Column 2 Maintenance must be carried out at regular intervals
1	Check the air flue gas installation for leaks and for proper fixation and ensure it is not blocked or damaged and is fitted correctly, complying with the relevant installation instructions.	x	x
2	Carry out a general inspection of the boiler for dirt and dust and clean as necessary.	x	x
3	Visually inspect the complete heat engine for its general condition and for signs of corrosion, sooting or other forms of damage (paying particular attention to the burner door seal). If damage is evident proceed to column 2.	x	x
4	Measure the gas flow rate during operation with maximum load (**→ section 10.11.3**). If the gas flow rate complies to the **→ table 10.2** continue with column 1, if not proceed to column 2.	x	x
5	Check the gas inlet working pressure (**→ section 10.11.4**) operation with maximum load. If the gas inlet working pressure complies to the **→ table 10.3** continue with column 1, if not proceed to column 2.	x	x
6	Check combustion by measuring CO, CO_2 and CO/CO_2. If the values are outside the tolerances of **→ table 12** proceed to maintenance column 2. You must not proceed with the maintenance if a new burner door seal kit is not available.	x	
7	Isolate the boiler from the power mains. Check whether the electrical plug connections and the other electrical connections are fitted tightly and correct them if necessary.	x	x
8	Close the gas isolation valve and the service valves.		x
9	Drain the pressure in the boiler on the water side (observe pressure gauge) and check the charge pressure of the expansion vessel. Top up if necessary.		x
10	Only with VUW boilers with actoSTOR: Check the charge pressure in the expansion vessel of the layered storage tank. Correct the pressure if necessary.	x	x
11	Remove the compact thermal module.		x
12	Check the integrity of all combustion circuit seals, especially the burner door seal. Ensure any damage found is repaired before proceeding.		x
13	Clean the heat exchanger (**→ section** 12.4.2).		x
14	Check whether the burner is dirty and clean it if necessary.		x
15	Check the condensate siphon in the boiler, clean and fill. Flush through all discharge pipe work (ensure route and termination are correct and it is unlikely to freeze up in severe weather).	x	x
16	Install the compact thermal module. Caution: **Use new seals and nuts!**		x
17	For VUW boilers: Replace the hot water heat exchanger if the volume of water is insufficient or the output temperature is not reached		x
18	For VUW boilers: Remove the impeller sensor, clean the filter in the cold water inlet of the sensor and refit the sensor.		x
19	Service the domestic hot water cylinder (see note below).*	x	x
20	Open the gas isolation valve, reconnect the boiler with the power mains and switch on the boiler.	x	x
21	Open the service valves and fill up the boiler/appliance to approximately 0,1 - 0,2 MPa (1,0 - 2,0 bar) (depending on the static height of the system). Start the purging program P.00.		x
22	Perform a test operation of the boiler and heating installation, including hot water generation and purge again if necessary.	x	x
23	Perform the gas family check (**→ section 12.1.5**).		x
24	Check visually the ignition and burner performance.	x	x
25	Check the boiler for leaks of any kind (gas, flue gas, water, condensate) and rectify as necessary.	x	x
26	If you had problems with the CO, CO_2, CO/CO_2-values in Step 6 before the maintenance, check them again now (**→ table 12.1**). If they are outside of the tolerances of **→ table 12.1** make an adjustment, see **→ section 12.1.4**.		x
27	Complete the Benchmark gas boiler commission service record on the back pages of this manual.	x	x

12.3 Inspection and maintenance steps

* Additional checks and procedures will be required where the boiler is used with a cylinder or solar thermal system. These are not covered in this manual.

12.2.1 Filling the boiler and the heating installation

A description of how to fill the boiler and the heating installation is provided in → **section 10.7**.

12.2.2 Draining the boiler

- ➤ Close the service valves of the boiler.
- ➤ Start test program P.06 (diverter valve mid-position) (→ **section 10.7**).
- ➤ Open the drain valves on the service valves.
- ➤ Make sure that the cap of the automatic air vent on the internal pump is open so that the boiler can be drained fully.

12.2.3 Draining the entire heating installation

- ➤ Attach a hose to the draining device on the system.
- ➤ Bring the open end of the hose to an appropriate drain point.
- ➤ Start test program P.06 (diverter valve mid-position) (→ **section 10.7**).
- ➤ Make sure that the service valves on the boiler and the cap of the automatic air vent on the internal pump is open.
- ➤ Open the drain cock.
- ➤ Open the purging valves of the radiators.
  Start from the highest radiator and then work from top to bottom.
- ➤ Once the water has drained off, close the purging valves of the radiators and the drain cock.

12.3 Using the function menu

You can use the function menu to service the ecoTEC plus as it allows you to actuate and test individual components of the heating installation.

Menu → Installer level → Test programs → Function menu

- ➤ Use the minus button [−] or the plus button [+] to go to the components of the heating installation.
- ➤ Confirm your selection using the right selection button [▭] ("Select").

Cancelling the function test

- ➤ Press the left selection button [▭] ("Cancel") to stop the function test.

You can test the operation of the heating installation components listed below using the self tests in the function menu.

Display	Test programs	Action
T.01	Check internal pump	You can switch the internal pump on and off.
T.02	Check 3-way valve	You can move the diverter valve to the heating position or to the hot water position.
T.03	Check fan	You can switch the fan on and off. The fan runs at maximum speed.
T.04	Check cylinder charge pump	You can switch the cylinder charging pump on and off.
T.05	Check circulation pump	You can switch the circulation pump on and off.
T.06	Check external pump	You can switch the external pump on and off.
T.08	Check burner	The boiler starts, carries out the necessary self-test and switches to minimum load. The flow temperature is shown in the display.

12.4 Self tests in the function menu

12.3.1 Carrying out electronics self-tests

Menu → Installer level → Test programs → Electronics self-test

In case service is required you should use the electronic self-test to check the PCB in advance.

12.4 Carrying out maintenance work

12.4.1 Removing the compact thermal module

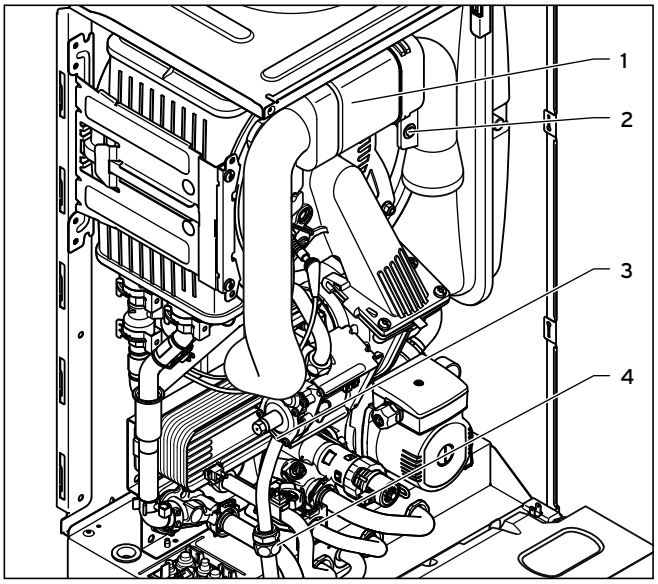
Danger!
Risk of being burned or scalded by hot components!
There is danger of being burned or scalded at the compact thermal module and at all water-carrying components.
- ➤ Only carry out work on these components if they have cooled down.

The compact thermal module consists of five main components:

1. Speed-regulated fan
2. Gas valve including support plate
3. Venturi including mass flow sensor and gas supply pipe
4. Burner door
5. Premix burner

- ➤ Switch off the boiler using the on/off switch.

- ➤ Close the gas isolator cock on the boiler.
- ➤ Close the service valves on the boiler.
- ➤ Remove the front casing from the boiler (➞ **section 4.7**).
- ➤ Fold the electronics box forwards (➞ **section 8.2**).

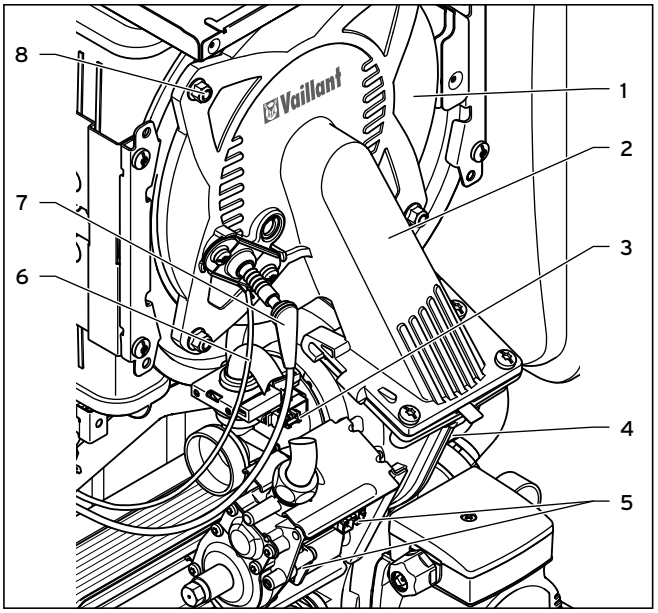


12.3 Remove the air intake pipe

- ➤ Unscrew the retaining screw (**2, ➞ fig. 12.3**) and detach the air intake pipe (**1, ➞ fig. 12.3**) from the intake stub.

Caution.
Risk of damage to the gas pipe.
The corrugated gas pipe may become damaged.
- ➤ Do not suspend the compact thermal module on the flexible corrugated gas pipe.
- ➤ Do not suspend any loads from the corrugated gas pipe.

- ➤ Either unscrew the cap nut (**3, ➞ fig. 12.3**) from the gas valve or the cap nut (**4, ➞ fig. 12.3**) between the corrugated gas pipe and the fixed gas pipe.



12.4 Removing the compact thermal module

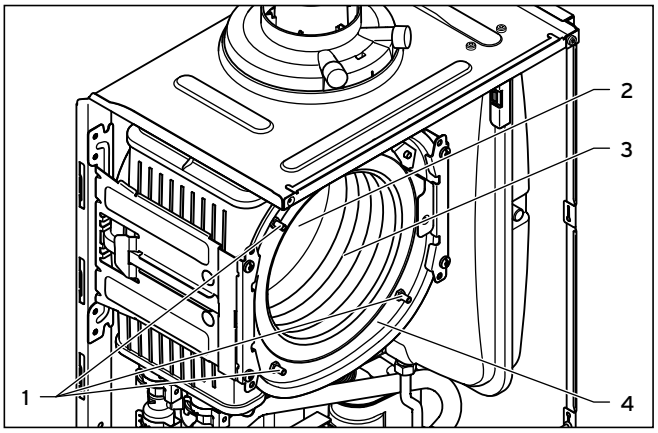
The plugs at the fan motor and the venturi have latching lugs with which they engage in the slot. You have to push in the latching lug to pull off the plug.

- ➤ Remove the plug of the ignition line (**7, ➞ fig. 12.4**) and the ground connection (**6, ➞ fig. 12.4**) from the ignition electrode.
- ➤ Remove the plug (**4, ➞ fig. 12.4**) from the fan motor.
- ➤ Remove the three plugs from the gas valve (**5, ➞ fig. 12.4**).
- ➤ Remove the plug from the venturi (**3, ➞ fig. 12.4**).
- ➤ Release the cable harness from the clip on the gas valve retainer.
- ➤ Unscrew the four nuts (**8, ➞ fig. 12.4**).
- ➤ Remove the entire compact thermal module (**2, ➞ fig. 12.4**) from the heat exchanger (**1, ➞ fig. 12.4**).
- ➤ Once removed, check the burner and the heat exchanger for damage and dirt.
- ➤ If necessary, clean the components according to the following sections.
- ➤ Check the burner flange insulation on the module. If signs of damage, other than small cracks, are apparent you must replaced it (article number 193 595).

12.4.2 Cleaning the heat exchanger

Caution.
Risk of damage from water spray.
If you fail to protect the electronics box adequately, water can penetrate the box during cleaning and may damage the electronics.
- ➤ Protect the folded down electronics box against sprayed water.

- ➤ Remove the compact thermal module (→ **section 12.4.1**).



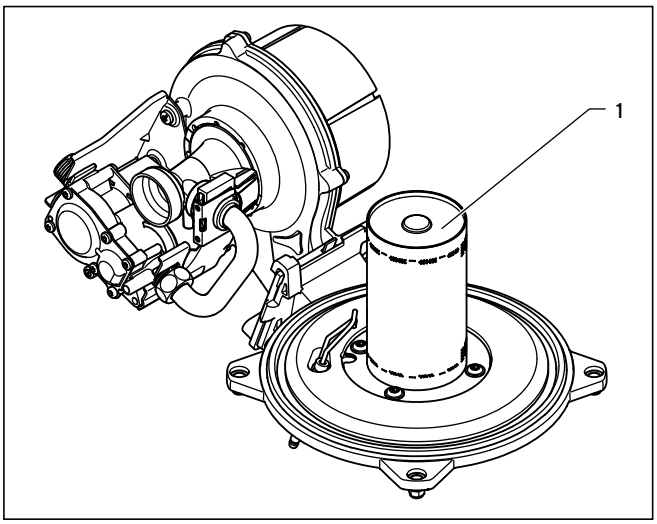
12.5 Cleaning the heat exchanger

Caution.
Risk of damage to heat exchanger.
- ➤ You should neither loosen nor tighten the four screws (**1**).

- ➤ Clean the heating coil (**3**) of the heat exchanger (**4**) using water or if required commercially-available white vinegar.
- ➤ Allow the vinegar to act on the heat exchanger for 20 minutes.
- ➤ Rinse away any loose dirt with a sharp jet of water or use a plastic brush.
- ➤ Do **not** point the water jet directly at the insulating surface (**2**) on the back of the heat exchanger.

The water flows out of the heat exchanger through the condensate siphon.

12.4.3 Checking the burner

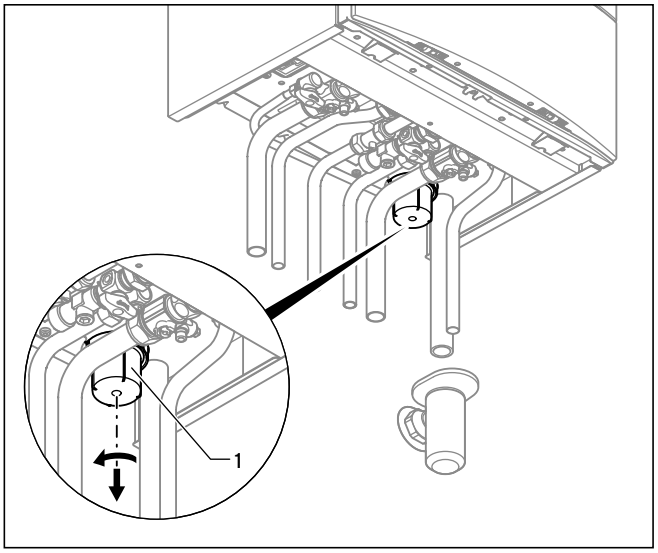


12.6 Checking the burner

As the burner (**1**) is maintenance-free, it does not require cleaning.
- ➤ Check the surface of the burner for damage.
- ➤ If necessary, replace the burner.

12.4.4 Cleaning the condensate siphon

Danger!
Risk of death caused by improper maintenance.
If you operate the boiler with an empty condensate siphon, flue gas can escape into the room air.
- ➤ Top up the condensate siphon after each cleaning session.

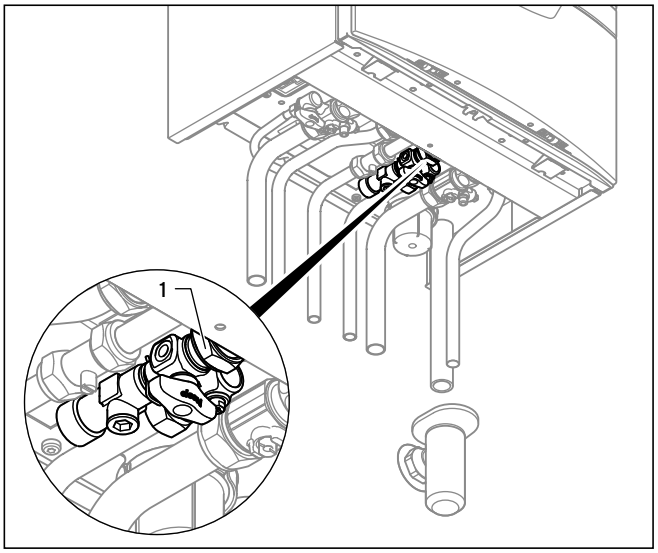


12.7 Cleaning the condensate siphon

- ➤ Remove the lower part (**1**) of the condensate siphon by turning the bayonet fitting anti-clockwise.
- ➤ Clean the bottom of the siphon by flushing it out with water.
- ➤ Fill the lower section of the siphon with water up to about 10 mm below the upper edge.
- ➤ Re-fit the lower part of the condensate siphon.
- ➤ Flush through all discharge pipe work (ensure route and termination are correct and it is unlikely to freeze up in severe weather).

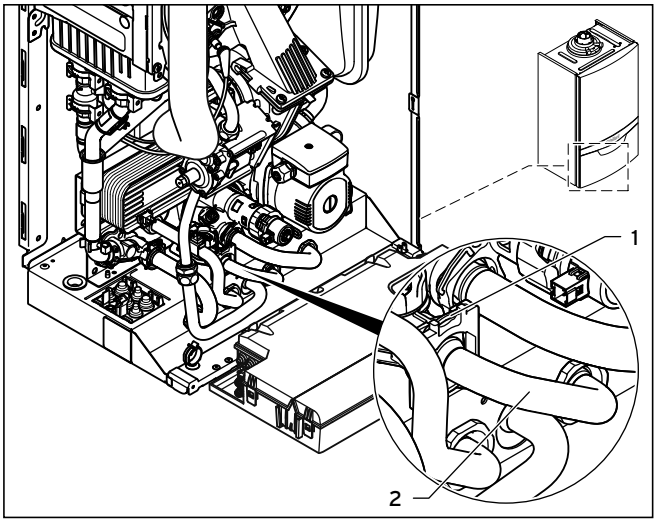
12.4.5 Clean the filter in the cold water inlet (VUW boilers only)

There is a filter in the cold water inlet of the boiler which must be cleaned during maintenance work.



12.8 Removing the filter from the cold water inlet

- ➤ Close the cold water stop valve.
- ➤ Drain the hot water from the boiler.
- ➤ Undo the nut (**1, ➞ fig. 12.8**) of the cold water supply line from the casing of the boiler.



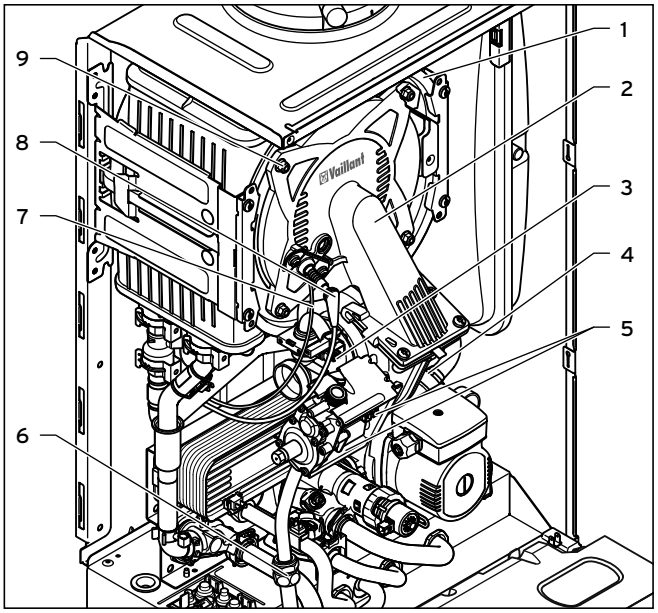
12.9 Removing the pipe with the cold water filter

- ➤ Fold the electronics box forwards (**➞ section 8.2**).
- ➤ Detach the clamp (**1, ➞ fig. 12.9**) from the flow sensor.
- ➤ Pull off the cold water pipe from the flow sensor.
- ➤ Remove the pipe (**2, ➞ fig. 12.9**) from the boiler.
- ➤ Rinse the filter under a jet of water holding against the direction of flow.
- ➤ Refit the pipe with the cleaned filter in the reverse order.
- ➤ Always use new seals.

12.4.6 Installing the compact thermal module

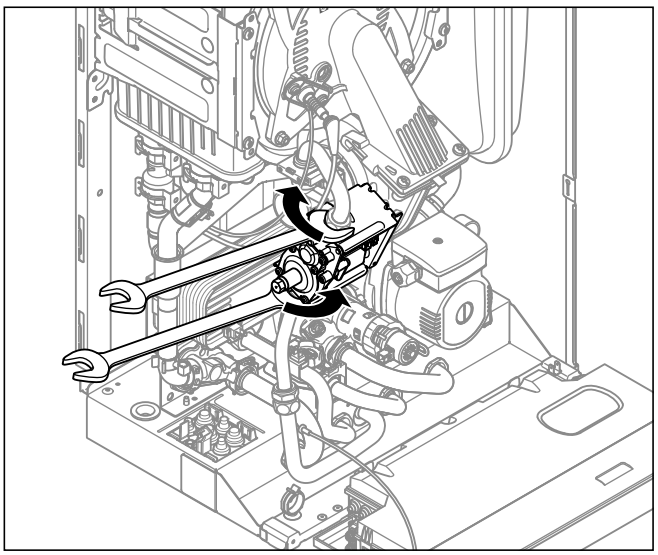
Danger!
Risk of death and risk of damage caused by hot flue gas!
If you do not renew the seal and the self-locking nuts on the burner door, hot flue gases may escape and cause personal injury and material damage.

- ➤ Replace the seal each time you open the burner door.
- ➤ Replace the self-securing nuts each time you open the burner door.
- ➤ If the burner flange insulation on the module shows signs of damage other than small cracks it must be replaced (article number 193 595).



12.10 Installing the compact thermal module

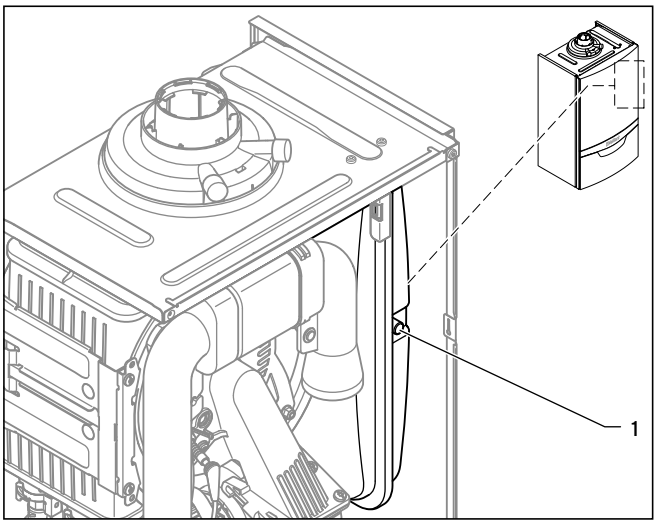
- Attach the compact thermal module (**2, → fig. 12.10**) to the heat exchanger (**1, → fig. 12.10**).
- Tighten the four nuts (**9, → fig. 12.10**) crosswise until the burner door fits closely and uniformly onto the mating surfaces (If a torque spanner is available, set at 6 Nm).
- Attach the plug of the ignition line (**7, → fig. 12.10**) and the ground connection (**8, → fig. 12.10**) to the ignition electrode.
- Attach the plug (**4, → fig. 12.10**) to the fan motor.
- Attach the three plugs to the gas valve (**5, → fig. 12.10**).
- Attach the cable to the venturi (**3, → fig. 12.10**).



12.11 Tightening the cap nuts on the gas valve

- Connect the gas supply (**6, → fig. 12.10**) to the gas valve with a new seal.
  When the cap nuts are being screwed to the gas valve, counterhold the opposite side of the gas valve or tighten both of the gas valve cap nuts simultaneously.
- Open the gas isolator cock on the boiler and ensure there are no leaks.
- Check that the sealing ring in the air intake pipe is positioned correctly in the seal seat.
- Insert the air intake pipe (**1, → fig. 12.3**) back into the intake stub.
- Attach the air intake pipe using the retaining screw (**2, → fig. 12.3**).

12.4.7 Checking the charge pressure of the expansion vessel



12.12 Checking the charge pressure of the expansion vessel

The service valves of the boiler must be closed.

- Measure the charge pressure of the expansion vessel at the testing nozzle (**1**) of the vessel with the boiler depressurised.
- Top up the expansion vessel at a pressure of less than 0.75 bar in accordance with the static height of the heating installation, ideally with nitrogen, otherwise with air. Ensure drain valve on boiler is open during topping up.
- If water escapes from the measuring stub pipes (**1**) of the expansion vessel, you must replace the expansion vessel.

12.5 Checking the gas flow pressure

- Check the gas flow pressure (**→ section 10.11.4**).

12.5.1 Checking CO_2 content

- Check the CO_2 content (**→ section 12.1.3**).

13 Troubleshooting

13.1 Contact Vaillant Service Solutions (0870 6060 777)

- If you contact Vaillant Service Solutions (0870 6060 777) or your Vaillant service partner, if possible, please mention
  - the fault code displayed (F.xx),
  - the boiler status that is displayed (S.xx) in the "Live Monitor" (→ **section 13.2.1**).

13.2 Performing diagnostics

You can use the function menu to control and test individual components of the boiler in the fault diagnosis.

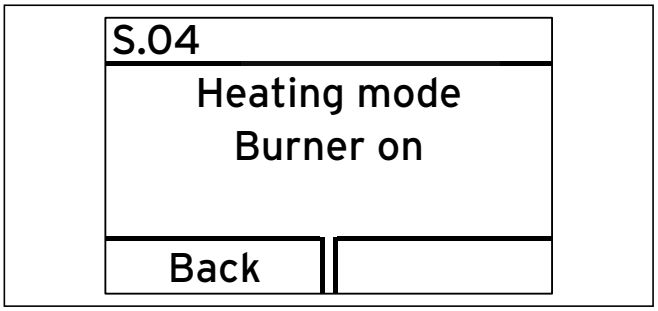
Menu → Installer level → Test programs → Function menu

- Use the function menu for fault diagnosis (→ **section 12.3**).

13.2.1 Call up Live Monitor (status codes)

Menu → Live monitor

You can call up the boiler status codes in the display which provide information on the current operating status of the boiler.



13.1 Status code display view

13.2.2 Status codes – Overview

Display	Meaning
Heating mode	
S.00	Heating, no heat demand
S.01	Heating mode fan start-up
S.02	Heating mode pump flow
S.03	Heating mode, ignition
S.04	Heating mode, burner on
S.05	Heating mode, pump/fan overrun
S.06	Heating mode, fan overrun
S.07	Heating mode, pump overrun
S.08	Heating mode, burner anti-cycling time
DHW mode (VUW boiler)	
S.10	Hot water demand via impeller sensor
S.11	DHW mode, fan start-up
S.13	DHW mode, ignition
S.14	DHW mode, burner on
S.15	DHW mode, pump/fan overrun
S.16	DHW mode, fan overrun
S.17	DHW mode, pump overrun
DHW mode, (VU boiler with cylinder or VUW comfort mode warm start)	
S.20	DHW demand
S.21	DHW mode, fan start-up
S.22	DHW mode, pump running
S.23	DHW mode, ignition
S.24	DHW mode, burner on
S.25	DHW mode, pump/fan overrun
S.26	DHW mode, fan overrun
S.27	DHW mode, pump overrun
S.28	Hot water burner anti-cycling time
Special cases	
S.30	Room thermostat (RT) is blocking heating mode
S.31	Summer mode active or no heat requirement from eBUS controller
S.32	Waiting period because of fan speed deviation
S.34	Frost protection mode active
S.39	"Burner off contact" has triggered (e.g. contact thermostat or condensate pump)
S.40	Comfort safety mode is active: Boiler running with limited heating comfort (→ **section 13.2.3**)
S.41	Water pressure > 2.8 bar
S.42	Flue non-return flap return signal blocks burner operation (only in connection with VR40 accessory) or condensate pump faulty, heat requirement is blocked
S.46	Comfort safety mode, flame loss at minimum load
S.53	Boiler is in waiting period of modulation block/operation block function due to water shortage (supply-return spread too large)
S.54	Boiler is in waiting period of operation blocking function as a result of water shortage (temperature gradient)
S.57	Waiting period, comfort safety mode
S.58	Modulation limitation due to noise/wind
S.61	Gas family check unsuccessful: The coding resistor on the PCB does not match the entered gas family (see also F.92).

13.1 Status codes

Display	Meaning
S.62	Gas family check unsuccessful: CO/CO_2 values at limit. Check combustion.
S.63	Gas family check unsuccessful: Combustion quality outside permissible range (see also F.93).
S.76	System pressure too low; top up water
S.96	Return temperature sensor test running, heating demands are blocked
S.97	Water pressure sensor test running, heating demands are blocked
S.98	Flow/return temperature sensor test running, heating demands are blocked

13.1 Status codes (continuation)

13.2.3 Service messages

If the "open-end spanner" maintenance symbol appears on the display, a service message is present. The maintenance symbol appears if you have set a maintenance interval, for example, (**→ section 11.1.6**) and it has elapsed. The boiler is not in fault mode but continues to operate.

To obtain more information about the service message:
➤ Call up the "Live Monitor" (**→ section 13.2.1**).

If status code S.40 is displayed as well as the maintenance symbol, the boiler is in comfort protection mode. This means that the boiler continues to operate with restricted comfort after it has detected a fault (e.g. because of a severe storm).
➤ In this case, read out the fault memory in order to determine whether a boiler component is defective (**→ section 13.2.5**).

If no fault message is present, the boiler will automatically switch back to normal operation after a certain time. Comfort safety mode may then have been triggered by a severe storm, for example.

13.2.4 Calling up diagnosis levels

Menu → Installer level → Diagnosis menu
You can use the diagnosis menu to inspect parameters and modify certain parameters. An overview of the diagnosis codes can be found in **→ table 11.1**.

13.2.5 Reading off the fault codes

If a fault develops in the boiler, the display shows a fault code F.xx.
A plain text display explains the displayed fault code.
Example F.10: "Flow temperature sensor short circuit".

Fault codes have priority over all other displays. If a fault occurs, the display no longer shows the current heating flow temperature of the heating installation.

If multiple faults occur at the same time, the display shows the corresponding fault codes for two seconds each in sequence.

➤ Remedy the fault.
➤ To restart the boiler, press the reset button (**→ Operating instructions**).
➤ If you are unable to remedy the fault and the fault reoccurs despite having carried out several resets, contact Vaillant customer service Vaillant Service Solutions (0870 6060 777).

13.2.6 Querying the fault memory

Menu → Installer level → Fault list

The boiler has a fault memory.
Here you can query the last ten faults that occurred in chronological order.
The display shows:
– the number of faults that have occurred
– the fault currently selected with fault number F.xx.
– a plain text display explaining the fault

➤ You can display the last 10 faults that occurred using the minus button [−] or the plus button [+].

13.2.7 Reset fault memory

You can delete the entire fault list.
➤ Press the right selection button [ ] ("Delete").
➤ Confirm the deletion of the fault memory by pressing the right selection button again [ ] ("OK").

13.2.8 Overview of fault codes

Code	Meaning	Cause
F.00	Flow temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC defective
F.01	Return temperature sensor interruption	NTC plug not plugged in or has come loose, multiple plug on the PCB not plugged in correctly, interruption in cable harness, NTC defective
F.02	Interruption cylinder charging sensor actoSTOR (NTC) only in combination with F.91	NTC defective, NTC cable defective, defective plug connection on NTC, defective plug connection on actoSTOR electronics
F.03	Interruption cylinder sensor actoSTOR (NTC) only in combination with F.91	NTC defective, NTC cable defective, defective plug connection on NTC, defective plug connection on actoSTOR electronics
F.10	Flow NTC short circuit	NTC defective, short circuit in cable harness, cable/casing
F.11	Return NTC short circuit	NTC defective, short circuit in cable harness, cable/casing
F.12	Short circuit at cylinder charging sensor (NTC) only in combination with F.91	NTC defective, short circuit in cable harness, cable/casing
F.13	VU-/VUW boiler: Short circuit warm start sensor/ cylinder sensor VUW boiler with actoSTOR: Short circuit cylinder sensor (NTC) only in combination with F.91	NTC defective, short circuit in cable harness, cable/casing
F.20	Safety switch-off: temperature limiter	Incorrect earth connection between cable harness and boiler, flow or return NTC defective (loose connection), black discharge via ignition cable, ignition plug or ignition electrode
F.22	Safety switch-off: low water pressure	No or to low water pressure in the boiler, water pressure sensor defective, cable to pump or water pressure sensor loose/not connected/defective
F.23	Safety switch-off: Temperature difference too great	Pump blocked, insufficient pump output, air in boiler, flow and return NTC interchanged
F.24	Safety switch-off: Temperature rise too fast	Pump blocked, poor pump performance, air in boiler, system pressure too low, non-return valve blocks/incorrectly installed
F.25	Safety switch-off: Flue gas temperature too high	Break in plug connection for optional flue gas safety thermostat (STB), break in cable harness
F.26	Fault: Gas valve without function	Gas valve stepper motor not connected, multiple plug on the PCB not plugged in correctly, interruption in cable harness, gas valve stepper motor defective, electronics defective
F.27	Safety switch-off: Flame simulation	Moisture on the electronics, electronics (flame monitor) defective, gas solenoid valve leaking
F.28	Failure during start-up: ignition unsuccessful	Gas meter defective or gas pressure regulator has triggered, air in gas, gas flow pressure too low, thermal isolator device (TAE) has triggered, condensate duct blocked, incorrect gas restrictor, incorrect ET gas valve, fault on the gas valve, multiple plug on PCB incorrectly plugged in, break in cable harness, ignition system (ignition transformer, ignition cable, ignition plug, ignition electrode) defective, ionisation current interrupted (cable, electrode), incorrect earthing of boiler, electronics defective
F.29	Failure during operation: Re-ignition unsuccessful	Gas supply temporarily stopped, flue gas recirculation, condensate duct blocked, faulty earthing of boiler, ignition transformer has spark failure
F.32	Fan fault	Plug at fan not correctly plugged in, multiple plug on PCB not correctly plugged in, break in cable harness, fan blocked, Hall sensor defective, electronics defective
F.35	Air/flue gas duct fault	Air/flue gas duct blocked
F.42	Coding resistor fault (possible in combination with F.70)	Short circuit/interruption in coding resistor output range (in cable harness at heat exchanger) or gas group resistor (on PCB)

13.2 Fault codes

Code	Meaning	Cause
F.49	eBUS fault	Short circuit on eBUS, eBUS overload or two power supplies with different polarities on the eBUS
F.52	Mass flow sensor connection fault	Mass flow sensor not connected/disconnected, plug not connected or incorrectly connected
F.53	Mass flow sensor fault	Mass flow sensor faulty, filter below venturi filter cap wet or blocked, gas flow pressure too low
F.54	Gas pressure fault (in combination with F.28/F.29)	No or too little gas supply pressure, gas valve closed
F.56	Fault: Mass flow sensor regulation	Gas valve defective, cable harness to gas valve defective
F.57	Fault during comfort safety mode	Ignition electrode highly corroded
F.61	Fault: Gas valve regulation	- Short circuit/short to earth in cable harness for the gas valve - Gas valve defective (coils shorted to earth) - Electronics defective
F.62	Fault: Gas valve switch-off delay	- Delayed shutdown of gas valve - Delayed extinguishing of flame signal - Gas valve leaking - Electronics defective
F.63	EEPROM error	Electronics defective
F.64	Electronics/NTC fault	Supply or return NTC short circuited, electronics defective
F.65	Electronic temperature fault	Electronics overheating due to external influences, electronics defective
F.67	Electronics/flame fault	Implausible flame signal, electronics defective
F.68	Unstable flame signal fault	Air in gas, gas flow pressure too low, wrong air ratio, condensate route blocked, wrong gas restrictor, ionisation flow interruption (cables, electrodes), flue gas recirculation, condensate route
F.70	Invalid device specific number (DSN)	Spare part case: Display and PCB replaced at same time and DSN not set, wrong or missing output range coding resistor
F.71	Flow NTC fault	Flow temperature sensor signalling constant value: - Flow temperature sensor incorrectly positioned at supply pipe. - Flow temperature sensor defective.
F.72	Flow/return NTC fault	Flow/return NTC temperature difference too great -> flow and/or return temperature sensor defective
F.73	Water pressure sensor signal in the wrong range (too low)	Interruption/short circuit of water pressure sensor, interruption/short circuit to GND in supply line to water pressure sensor or water pressure sensor defective
F.74	Water pressure sensor signal outside correct range (too high)	Cable to water pressure sensor has short-circuited at 5 V/24 V or internal fault in water pressure sensor
F.75	Fault, no pressure change detection when starting pump	Water pressure sensor and/or pump defective, air in heating installation, too low water pressure in boiler; check adjustable bypass, connect external expansion vessel to return
F.76	Overheating protection on primary heat exchanger has responded	Cable or cable connections for safety fuse in primary heat exchanger or primary heat exchanger defective
F.77	Flue non-return flap/condensate pump fault	No response from flue non-return flap or condensate pump defective
F.78	Interruption to DHW outlet sensor at external controller	UK link box is connected, but hot water NTC not bridged
F.83	Flow and/or return temperature sensor temperature change fault	When the burner starts, the temperature change registered at flow and/or return temperature sensor is non-existent or too small. - Not enough water in the boiler - Flow and/return temperature sensor not in correct position at pipe.
F.84	Fault: Flow/return temperature sensor temperature difference implausible	Flow and return temperature sensors returning implausible values. - Flow and return temperature sensors have been inverted. - Flow and return temperature sensors have not been correctly fitted.
F.85	Fault: Flow and return temperature sensors incorrectly fitted	Flow and/or return temperature sensors have been fitted to the same pipe/wrong pipe.
F.92	Coding resistor fault	The coding resistor on the PCB does not match the entered gas family Check the resistor, repeat the gas family check and enter the correct gas family.

13.2 Fault codes (continued)

Code	Meaning	Cause
F.93	Gas group fault	Combustion quality outside the permitted range: Wrong gas restrictor, recirculation, wrong gas group, internal pressure measuring point in venturi blocked (do not use lubricant on O-ring in venturi.). Gas family check prematurely terminated.
Communication fault	No communication with the PCB	Communication fault between display and PCB in the electronics box

13.2 Fault codes (continued)

13.3 Using the function menu

In order to remedy boiler problems, you can use the function menu, which allows you to actuate and test individual components of the heating installation (**→ section 12.3**).

13.4 Running test programs

By activating various test programs, you can trigger special functions on the boiler
(**→ table. 10.1**). The display shows which test program you have chosen.

➤ Read how to start the test programs in **→ section 10.4**.

13.5 Resetting parameters to factory settings

As well as the option to manually reset individual parameters to the factory settings specified in **→ table 11.1**, you can also reset all parameters at once.

➤ Set the value of the diagnosis code parameter D.096 to "1" (**→ section 11.1**).

You have now reset all parameters to factory settings.

14 Replacing components

The work described in this section must only be carried out by an approved competent person.

➤ Only use genuine Vaillant spare parts for repairs.

An overview of the available genuine Vaillant spare parts can be obtained:

- From your parts wholesaler
- Alternatively contact Spares Technical Enquiries on 01773 596615
  or via email: technicalspares@groupservice.co.uk

14.1 Preparing for and completing replacement work

14.1.1 Preparing for replacement work

Danger!
Risk of death from electric shock!
Mains connection terminals L and N remain live even if the continuous voltage on/off switch is turned off.

➤ Before carrying out maintenance work on the boiler, switch the boiler off using the on/off button.
➤ Disconnect the boiler from the power mains by disconnecting the mains plug or by de-energising the boiler via a partition with a contact opening of at least 3 mm (e. g. fuses or power switches).

When carrying out any repair to the boiler, make sure that you observe the following instructions for your own safety and to avoid material damage to the boiler.

➤ Switch off the boiler.
➤ Disconnect the boiler from the power mains (**→ section 11.3**).
➤ Remove the front casing (**→ section 4.7**).
➤ Close the gas isolator cock.
➤ Close the service valves in the heating flow and in the heating return.
➤ Close the service valve in the cold water supply pipe.
➤ Drain the boiler if you want to replace components that carry water (**→ section 11.3.2)**.
➤ Make sure that water does not drip on live components (e.g. the electronics box).
➤ Use only new seals and O-rings.

14.1.2 Completing replacement work

➤ Perform a gas family check after working on the gas route (**→ section 12.1.5**).

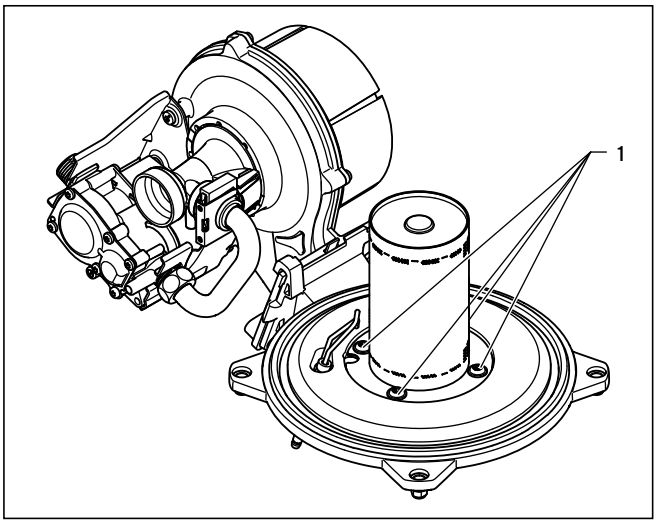
Caution!
Malfunction or shortened life expectancy!
The leak detection spray can damage the heating device.

➤ Do not spray the leak detection spray on the cover cap on the filter of the Venturis

➤ Check the boiler for gas leaks.
➤ Reattach the front casing (**→ section 4.7**).
➤ Perform a function check (**→ section 10.12**).

14.2 Replacing the burner

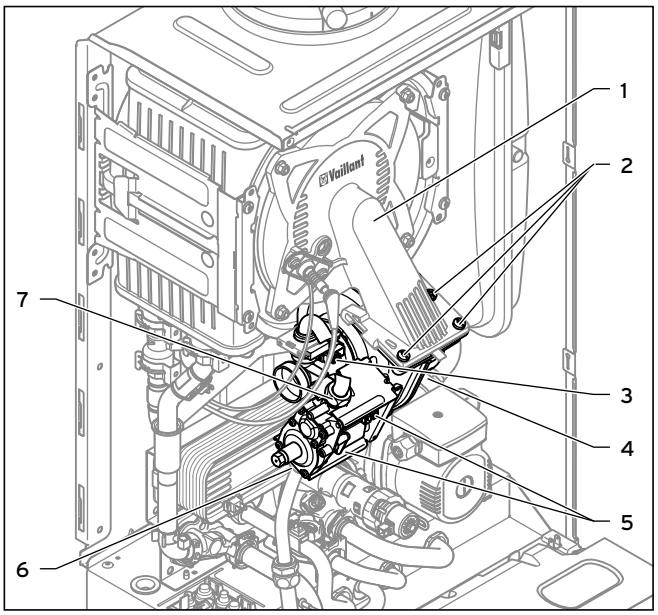
➤ Remove the compact thermal module (**→ section 12.4.1**).



14.1 Replacing the burner

➤ Undo the four screws (**1**) on the burner.
➤ Remove the burner.
➤ Fit the new burner with a new seal. Make sure that the nose on the burner window grips the seal inside the recess in the burner.
➤ Reinstall the compact thermal module. (**→ section 12.4.6**).

14.3 Replacing the fan



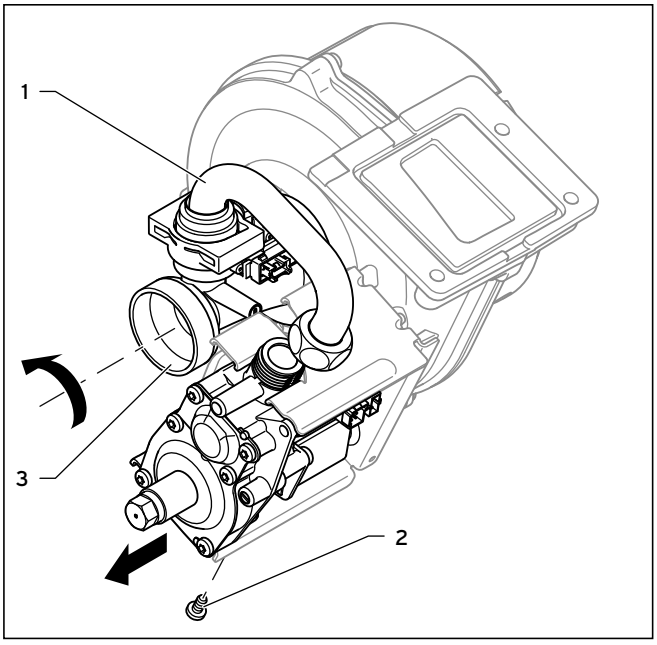
14.2 Removing the fan

- Remove the air intake pipe (→ **section 12.4.1**).
- Remove the three plugs from the gas valve (**5, → fig. 14.2**).

The plugs on the fan motor and the venturi have latching lugs with which they engage in the slot. You have to push in the latching lug to pull off the plug.

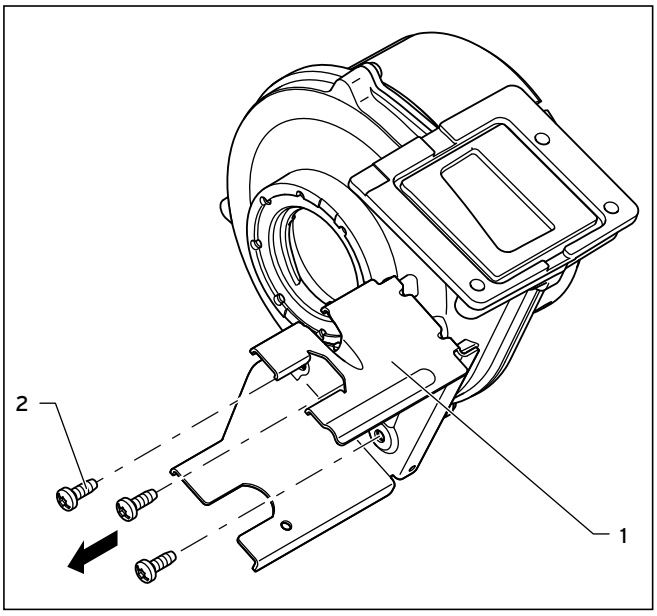
- Remove the plug from the sensor of the venturi (**3, → fig. 14.2**).
- Remove the plug(s) (depending on the boiler version) (**4, → fig. 14.2**) from the fan motor.
- Unscrew the two cap nuts at the top (**7, → fig. 14.2**) and bottom (**6, → fig. 14.2**) from the gas valve. Counterhold at the opposite side of gas valve when unscrewing, or unscrew both cap nuts at the same time.
- Unscrew the three screws (**2, → fig. 14.2**) between the mixture pipe (**1, → fig. 14.2**) and the fan flange.

Caution.
Risk of damage to the gas pipe.
The corrugated gas pipe can be damaged by incorrect handling.
- Do not suspend the gas valve on the flexible corrugated gas pipe.
- Do not suspend any loads on the corrugated gas pipe.



14.3 Removing the gas valve and venturi from fan

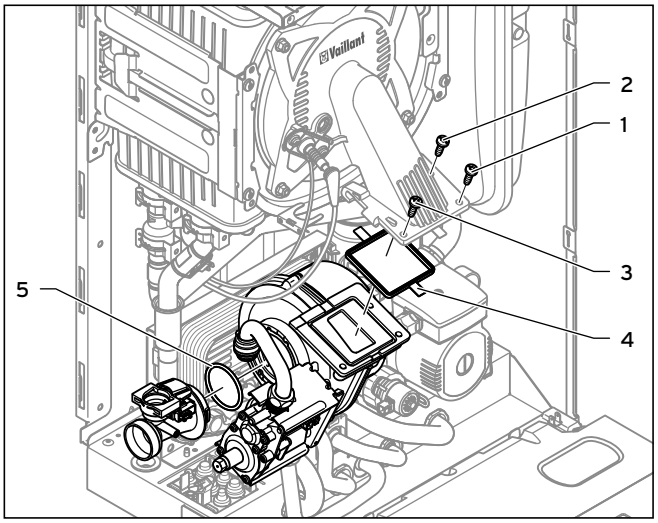
- Remove the entire fan/venturi/gas valve unit from the boiler.
- Unscrew the fixing screw (**2, → fig. 14.3**) of the gas valve out of the bracket.
- Remove the gas valve from the bracket.
- Remove the venturi (**3, → fig. 14.3**) with the gas connecting pipe (**1, → fig. 14.3**) out of the fan by turning the bayonet fitting of the venturi anti-clockwise as far as it will go and pulling it out of the fan (straight).



14.4 Removing the bracket of the gas valve

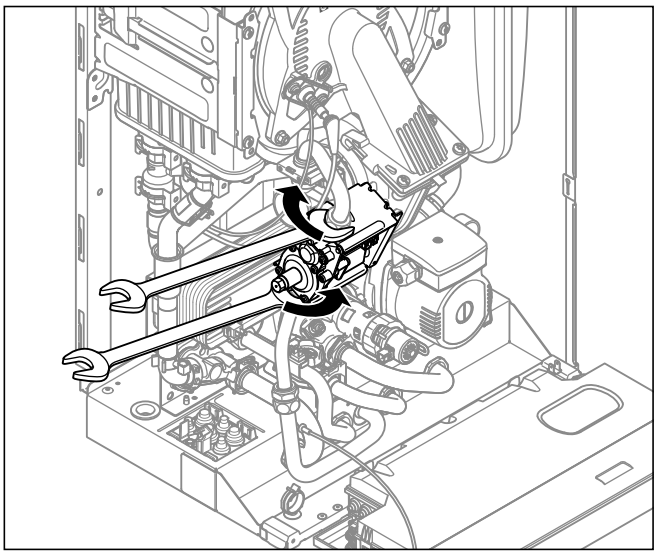
- Remove the bracket (**1, → fig. 14.4**) of the gas valve from the fan by unscrewing the three screws (**2, → fig. 14.4**).

➤ Replace the defective fan.



14.5 Installing the gas valve

➤ Refit the components in the reverse order. It is **imperative** that you use new seals (**4** and **5, → fig. 14.5**).
➤ Pay attention to the order in which the three screws between the fan and the mixture pipe are screwed in, as per the numbering **1, 2** and **3 (→ fig. 14.5)**.

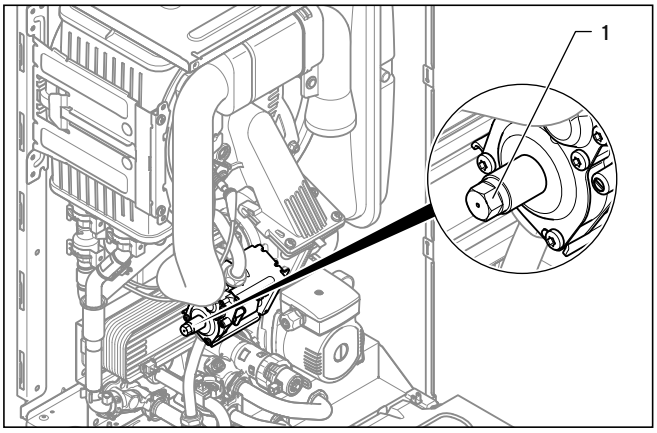


14.6 Tightening the cap nuts on the gas valve

➤ Screw the flexible gas pipe to the gas valve. Use new seals.
When the cap nuts are being screwed to the gas valve, counterhold the opposite side of the gas valve or screw both cap nuts to the gas valve simultaneously.
➤ Perform a gas family check after fitting the new fan (**→ section 12.1.5**).

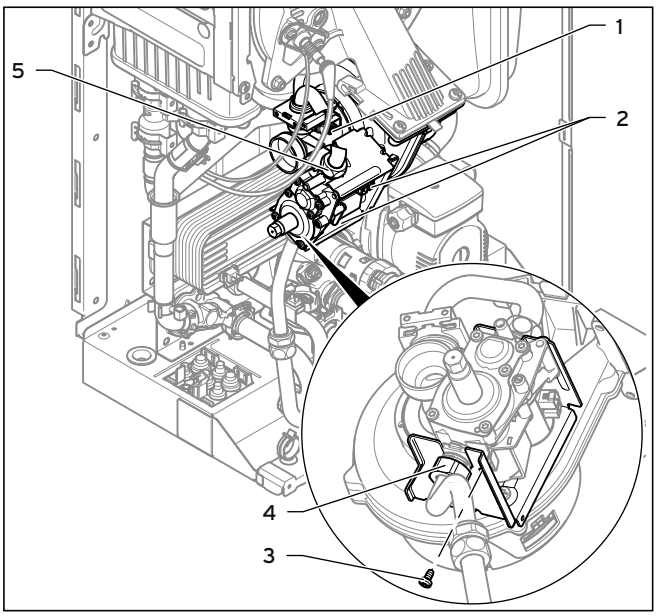
14.4 Replacing the gas valve

Caution.
Risk of material damage caused by making not permissible setting.
Modifications to the gas pressure regulator on the gas valve can destroy the gas valve and cause operating faults on the boiler.
➤ Never modify the factory setting for the gas pressure regulator of the gas valve.



14.7 Gas pressure regulator

Gas valves with gas pressure regulators (**1, → fig. 14.7**) are not installed in all boilers There are also versions without gas pressure regulators.



14.8 Replacing the gas valve

➤ Remove the air intake pipe (**→ section 12.4.1**).
➤ Remove the three plugs from the gas valve (**2, → fig. 14.8**).

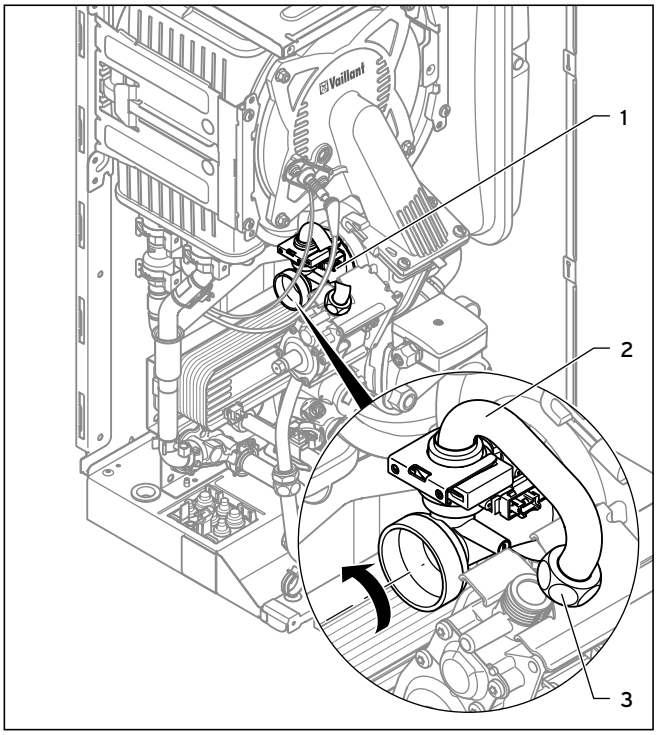
The plug on the venturi has latching lugs with which it engages in the slot. You have to release the latching lug by pushing it in to pull off the plug.

- Remove the plug from the sensor of the venturi (**1, → fig. 14.8**).
- Unscrew the two cap nuts at the top (**5, → fig. 14.8**) and bottom (**4, → fig. 14.8**) of the gas valve. Counterhold at opposite side of gas valve when unscrewing, or unscrew both cap nuts at the same time.
- Unscrew the fixing screw of the gas valve (**3, → fig. 14.8**) out of the bracket.

Since the fixing screw is difficult to access beneath the retaining plate, alternatively, you can remove the entire fan assembly (**→ section 14.3**).

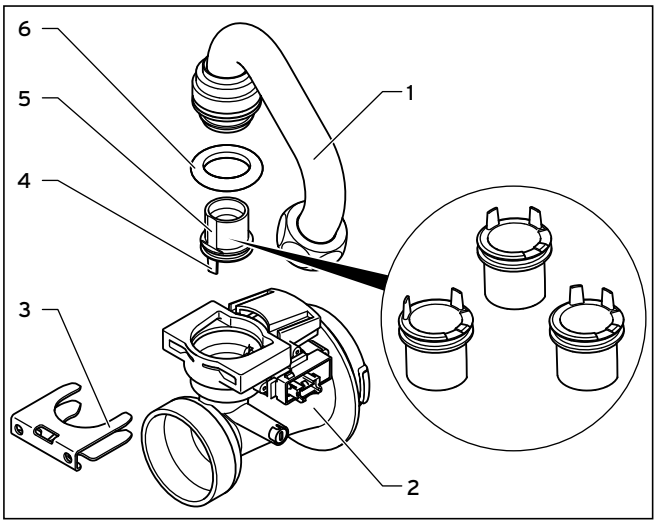
- Remove the gas valve from the bracket.
- Refit the new gas valve in the reverse order. Use new seals.
- When the cap nuts are being screwed to the gas valve, counterhold at the opposite side of the gas valve or tighten both cap nuts simultaneously (**→ fig. 14.6**).
- After installing the new gas valve, perform a gas family check (**→ section 12.1.5**) and a gas ratio setting (**→ section 10.11**).

14.5 Replacing the venturi including the mass flow sensor



14.9 Replacing the venturi including the mass flow sensor

- Remove the air intake pipe (**→ section 12.4.1**).
- Remove the plug from the sensor of the venturi (**1, → fig. 14.9**).
- Unscrew the cap nut (**3 → fig. 14.9**) of the gas connecting pipe (**2 → fig. 14.9**) from the gas valve.
- Remove the venturi including the gas supply pipe from the fan by turning the bayonet fitting on the venturi anti-clockwise as far as it goes and removing it from the fan.



14.10 Removing the gas connecting pipe

- Remove the gas connecting pipe (**1, → fig. 14.10**) from the venturi (**2 → fig. 14.10**) by detaching the clamp (**3, → fig. 14.10**) and pulling out the gas connecting pipe vertically. Dispose of the seal (**6, → fig. 14.10**).
- Pull off the gas restrictor (**5, → fig. 14.10**) in a straight direction, and dispose of it.
- Check whether the venturi is free of residue at the gas inlet side.

Danger!
Risk of poisoning due to increased CO levels!
Using the wrong gas restrictor size can cause higher CO levels.
- When replacing the venturi, ensure that you use the correct gas restrictor (colour coding and position of pins on the underside of the gas restrictor).

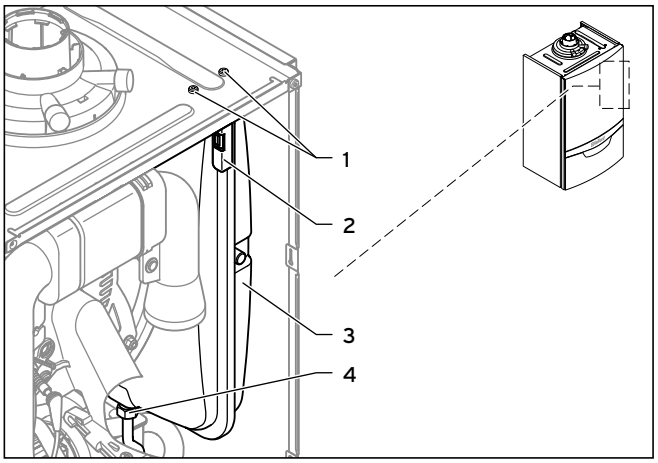
- Insert the gas restrictor for the gas group in question into the new venturi.
  Ensure that the colour of the gas restrictor corresponds with the colour of the coding resistor on the PCB in the electronics box.
  When inserting the gas restrictor, ensure that the gas restrictor is correctly aligned using the specified position marks on the top of the venturi and also the positioning pins (**4**) on the bottom of the gas restrictor.

Caution.
Risk of damage to boiler and possible malfunctions.
The use of lubricant can block function-related channels in the venturi.
➤ Never use lubricant when installing the gas restrictor.

➤ Refit the components in the reverse order. Use new seals.
➤ After installing the new venturi, perform a gas family check (→ **section 12.1.5**) and a gas ratio setting (→ **section 10.11**).

14.6 Replacing the expansion vessel

➤ Drain the boiler (→ **section 12.2.2**).



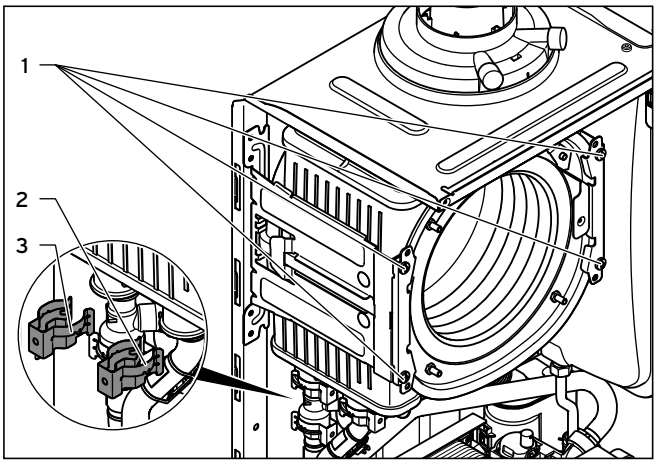
14.11 Replacing the expansion vessel

➤ Slacken the screw connection (**4**) at the water connection on the underside of the expansion vessel.
➤ Remove both screws (**1**) on the support plate (**2**).
➤ Remove the support plate (**2**).
➤ Pull out the expansion vessel (**3**) from the front.
➤ Insert the new expansion vessel into the boiler.
➤ Screw the new expansion vessel to the water connection. Use a new seal for this.
➤ Attach the support plate using both screws (**1**).
➤ If necessary, adjust the pressure to the static height of the heating installation (→ **section 12.4.7**).
➤ Fill and purge the boiler and the system, if necessary, after installing the new expansion vessel (→ **section 10.7**).
➤ On completion of the work, check for water leaks.

14.7 Replacing the heat exchanger

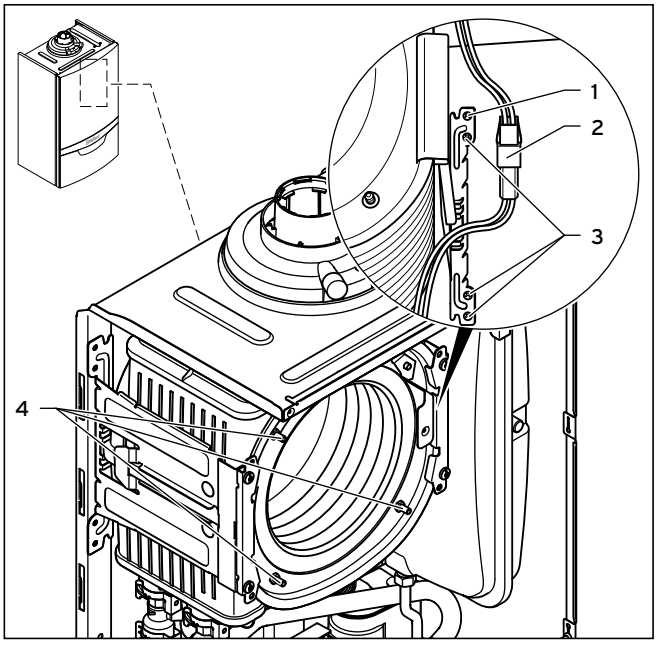
Caution.
Risk of damage to the heat exchanger.
➤ You can neither loosen nor tighten the four screws (→ **fig. 14.13, pos. 1**).

➤ Drain the boiler (→ **section 12.2.2**).
➤ Remove the compact thermal module (→ **section 12.4.1**).
➤ Detach the condensate drain hose from the heat exchanger.



14.12 Replacing the heat exchanger

➤ Detach the clamps (**2,** → **fig. 14.12**) and (**3,** → **fig. 14.12**) from the flow connection and the return connection.
➤ Detach the flow connection from the heat exchanger.
➤ Detach the return connection from the heat exchanger.
➤ Remove two screws (**1,** → **fig. 14.12**) from each of the two brackets of the heat exchanger.



14.13 Heat exchanger brackets

- ➤ Disconnect the plug connection (**2, → fig. 14.13**) of the thermal fuse in the heat exchanger.
- ➤ Remove the bottom three screws (**3, → fig. 14.13**) from the rear part of the heat exchanger bracket.
- ➤ Swivel the bracket around the top screw (**1, → fig. 14.13**) to one side.
- ➤ Pull the heat exchanger downwards and to the right, and remove it from the boiler.

Caution.
Risk of damage to the boiler.
Mineral oil-based lubricants may damage the seals. The seals should therefore not be lubricated.
- ➤ Only use water or commercially available soft soap, if necessary, to assist with installation.

With the new heat exchanger, ensure that you use the cable with the coding resistor and the correct plug.

- ➤ Install the new heat exchanger in the reverse order.
- ➤ Replace the seals.
- ➤ Insert the flow and return connections into the heat exchanger as far as they will go.

Make sure that the brackets are seated correctly on the flow and return connections.

- ➤ Re-install the expansion vessel (**→ section 14.6**).
- ➤ Reinstall the compact thermal module. (**→ section 12.4.6**).
- ➤ Fill and purge the boiler and, if necessary, the heating installation (**→ section 10.7**).

14.8 Replacing the PCB and/or the display

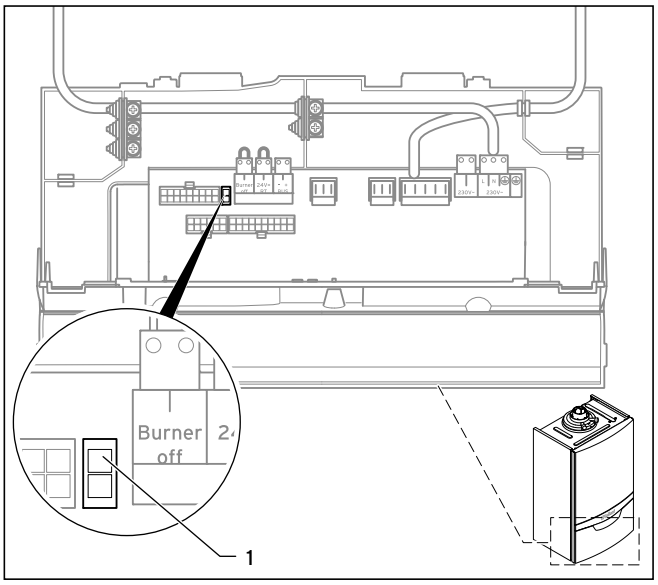
Danger!
Risk of death from electric shock!
Mains connection terminals L and N remain live even if the continuous voltage on/off switch is turned off!
- ➤ Before carrying out repair work on the boiler, switch the boiler off using the on/off button.
- ➤ Disconnect the boiler from the power mains by disconnecting the mains plug or by de-energising the boiler via a partition with a contact opening of at least 3 mm (e. g. fuses or power switches).

Caution.
Risk of material damage caused by incorrect repairs.
Using an incorrect spare part display can cause damage to the electronics.
- ➤ Before replacing, check that the correct spare part display is available.
- ➤ ONLY fit the correct spare part display.

Comply with the assembly and installation instructions provided with the spare parts.

14.8.1 Replacing either the display or the PCB

➤ Replace the PCB or display according to the assembly and installation instructions supplied.



14.14 Coding resistor

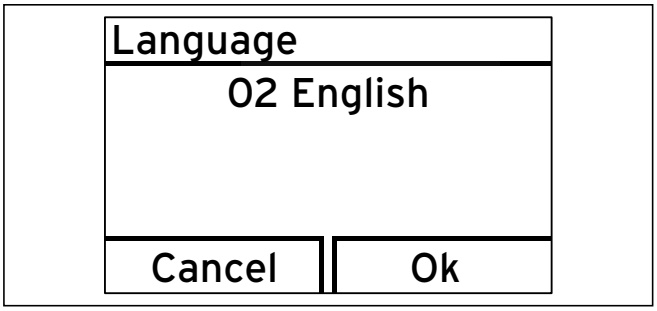
If you replace the PCB, you must remove the front left coding resistor (**1**) (plug X24) on the old PCB and insert it into the new PCB.

If you are replacing only one of the two components (PCB or display), the parameter matching functions automatically. By switching on the boiler, the new component takes over the previously set parameters from the unreplaced component.

14.8.2 Replacing the PCB and the display at the same time

Setting the language and appliance type

If you are replacing both components, you must detach the coding resistor (➞ **fig. 14.14, pos. 1**) (plug X24) at the front left from the old PCB and plug it into the new PCB.



14.15 Setting the language

If you are replacing both components at the same time (spare part case), the boiler switches directly to the menu for selecting the language after switching on. The default language setting is English. You can select the language that you require using the minus and plus buttons and confirm with OK.

You are then automatically taken to the appliance type setting D.093.

➤ Select the correct value for the relevant appliance type in accordance with ➞ **table 14.1**.

After confirmation, the display restarts itself automatically and then starts the installation assistant.

ecoTEC plus	Device specific number
612 (VU GB 126/5-5)	1
615 (VU GB 156/5-5)	3
618 (VU GB 186/5-5)	4
624 (VU GB 246/5-5)	9
630 (VU GB 306/5-5)	14
637 (VU GB 376/5-5)	20
824 (VUW GB 246/5-5)	6
831 (VUW GB 316/5-5)	10
837 (VUW GB 376/5-5)	17

14.1 Device specific numbers for the appliance types

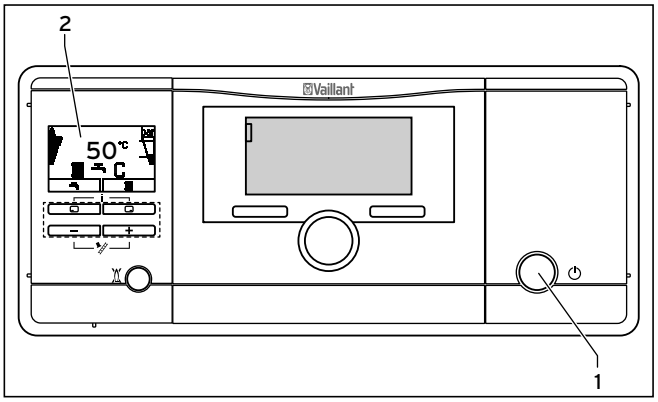
The electronics are now set to the appliance type and the parameters of all adjustable diagnosis codes are set to factory settings.

➤ Make the system-specific settings (➞ **section 11**).

15 Decommissioning

15.1 Temporarily shutting down the boiler

Caution.
Risk of frost damage due to incorrect shutdown.
If you switch off the boiler using the on/off switch or disconnect it from the power mains, this can cause frost damage to the heating installation.
- ➤ Only shutdown the boiler fully if the heating installation is otherwise protected from frost.
- ➤ Drain the heating installation fully.



15.1 Switching off the boiler

- ➤ Close the gas isolator cock.
- ➤ Close the cold water stop valve.
- ➤ Drain the heating installation fully (**→ section 12.2.2**).
- ➤ Press the on/off switch (**1**).

The display (**2**) goes off.

15.2 Taking the boiler permanently out of service

- ➤ Close the gas isolator cock.
- ➤ Close the cold water stop valve.
- ➤ Drain the heating installation fully (**→ section 12.2.2**).
- ➤ Press the on/off switch (**1**).

The display (**2**) goes off.

- ➤ Isolate the boiler from the power mains.
- ➤ Dispose of the boiler correctly (**→ section 15.3**).

15.3 Disposing of the boiler

The Vaillant ecoTEC plus boiler consists primarily of materials that can be recycled.
The boiler and its accessories must not be disposed of with household waste.

- ➤ Make sure that the boiler and any existing accessories are disposed of properly.

16 Guarantee and customer service

16.1 Factory guarantee

Two year guarantee for ecoTEC plus appliances
Vaillant undertakes to rectify any manufacturing defect that occurs within twenty-four months of the installation date. For the 2nd year of the guarantee to be valid an annual service must be carried out by a competent person approved at the time by the Health and Safety Executive one year after installation.
The cost of this annual service is not included in the guarantee.

Registering with us
Registration is simple. Just complete the Guarantee Registration Card and return to Vaillant within 30 days of installation. Your details will then be automatically registered within the Vaillant scheme.
Note: No receipt will be issued.

Immediate help
If your Vaillant boiler develops a fault your first action should be to contact your installer, as his professional assessment is needed under the terms of our Guarantee. If you are unable to contact your installer, phone Vaillant Service Solutions: 0870 6060 777

16.2 Vaillant Service

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions (0870 6060 777) for further details.

17 Technical data

ecoTEC plus	Unit	612 (VU GB 126/5-5)	615 (VU GB 156/5-5)	618 (VU GB 186/5-5)	624 (VU GB 246/5-5)	630 (VU GB 306/5-5)	637 (VU GB 376/5-5)
Nominal heat output range P at 50/30 °C	kW	3.3 - 12.9	3.3 - 16.1	4.2 - 19.3	5.7 - 25.7	6.4 - 32.1	7.1 - 39.6
Nominal heat output range P at 80/60 °C	kW	3.0 - 12.2	3.0 - 15.4	3.8 - 18.5	5.2 - 24.4	5.8 - 30.4	6.4 - 37.6
Maximum heat output for hot water generation	kW	12.2	15.4	18.5	24.4	30.4	37.6
Maximum heat input	kW	12.4	15.5	18.6	24.7	30.9	38.1
Minimum heat input G20	kW	3.2	3.2	4.0	5.5	6.2	6.8
Minimum heat input G31	kW	–	–	5.3	6.4	9.0	9.0
Minimum heat output with G31	kW	–	–	5.0	6.0	8.5	8.5
Heating output setting range	kW	3 - 12	3 - 15	4 - 18	5 - 24	6 - 30	6 - 37
Heating							
Max. flow temperature	°C	85					
Max. flow temperature setting range (factory setting: 75 °C)	°C	30 - 80					
Min. pressure for full operation	MPa/bar	0.08/0.8					
Permissible total over-pressure	MPa/bar	0.3/3					
Expansion vessel capacity	l	10					
Circulation water quantity (with reference to ΔT = 20 K)	l/h	516	645	774	1032	1290	1591
Condensate rate approx. (pH value 3.5 – 4.0) in heating mode 50 °C supply/30 °C return	l/h	1.2	1.6	1.9	2.5	3.1	3.8
Remaining feed head of pump (at nominal circulation water volume)	MPa/bar	0.025/0.25			0.020/0.20		
General							
Gas connection, boiler side	mm	15	15	15	15	15	22
Flow/return heating connections, boiler side	mm	22					
Hot and cold water connection, boiler side	Inches	G 3/4					
Connector expansion relief valve (minimum)	mm	15					
Condensate discharge pipework (minimum)	mm	19					
Flue gas spigot	mm	60/100 (concentric), optional 80/125 (concentric)					
Gas connection pressure (gas inlet working pressure) natural gas, G20	kPa/mbar	0.20/20					
Gas connection pressure (gas inlet working pressure) propane, G31	kPa/mbar	0.37/37					
Gas flow rate at 15 °C and 1013 mbar (based on hot water generation if applicable) G20 G31	m^3/h kg/h	1.3 0.96	1.6 1.2	2.0 1.44	2.6 1.92	3.3 2.4	4.0 2.96
Flue gas mass flow min./max.	g/s	1.4/5.6	1.4/7.0	1.8/8.4	2.4/11.1	2.7/13.9	3.0/17.1
Flue gas temperature min./max.	°C	40/70					
Certificated flue gas connections		C13, C33, C43, C53, C83, C93, B53P					
NOx class		5					
NOx	mg/kWh	19.7	22.9	25.9	32.3	30.2	36.0
SEDBUK (2005)		A					
SEDBUK (2009) (G20/G31)		89.0/-	89.1/-	89.3/90.3	89.4/-	89.4/90.4	89.2/-
Boiler dimensions (H x W x D)	mm	720 x 440 x 335				720 x 440 x 369	720 x 440 x 403
Mounting weight approx.	kg	35	35	35	37	39	41
Electrical connection	V/Hz	230/50					
Built-in fuse		2 A, slow-blow					
Electrical power consumption min./max.	W	65/90	70/95	75/100	70/100	75/110	100/130
Electrical power consumption at 30% partial load	W	40	40	45	50	50	50
Standby electrical consumption	W	< 2	< 2	< 2	< 2	< 2	< 3,3
Level of protection		IP X4 D					
Certification number		CE-0085CM0320					

17.1 Technical data for ecoTEC plus VU boiler

ecoTEC plus	Unit	824 (VUW GB 246/5-5)	831 (VUW GB 316/5-5)	837 (VUW GB 376/5-5)
Nominal heat output range P at 50/30 °C	kW	4.2 - 20.4	5.7 - 25.7	7.1 - 30.1
Nominal heat output range P at 80/60 °C	kW	3.8 - 19.3	5.2 - 24.4	6.4 - 28.6
Maximum heat output for hot water generation	kW	24.4	30.8	38.7
Maximum heat input for hot water generation	kW	24.7	31.2	39.2
Maximum heat input at the heating side	kW	19.6	24.7	28.9
Minimum heat input G20	kW	4.0	5.5	6.8
Minimum heat input G31	kW	6.4	6.4	9.0
Minimum heat output with G31	kW	6.0	6.0	8.5
Heating output setting range	kW	4 - 19	5 - 24	6 - 28
Heating				
Max. flow temperature	°C	85		
Max. flow temperature setting range (factory setting: 75 °C)	°C	30 - 80		
Min. pressure for full operation	MPa/bar	0.8		
Permissible total over-pressure	MPa/bar	0.3/3		
Expansion vessel capacity	l	10		
Circulation water quantity (with reference to ΔT = 20 K)	l/h	817	1032	1204
Condensate rate approx. (pH value 3.5 – 4.0) in heating mode 50 °C supply/30 °C return	l/h	2.0	2.5	2.9
Remaining feed head of pump (at nominal circulation water volume)	MPa/bar	0.025/0.25		0.020/0.20
DHW mode (VUW boiler only)				
Lowest water volume	l/min	1.5		
Water volume (at ΔT = 42 K)	l/min	8.2	10.3	13.0
Water volume (at ΔT = 35 K)	l/min	9,8	12,4	15,6
Water volume (at ΔT = 30 K)	l/min	11.5	14.5	18.2
Permitted overpressure	MPa/bar	1.0/10		
Required connection pressure	MPa/bar	0.035/0.35		
Hot water output temperature range	°C	35 - 65		
General				
Gas connection, boiler side	mm	15	15	22
Flow/return heating connections, boiler side	mm	22		
Hot and cold water connection, boiler side	Inches	G 3/4		
Connector expansion relief valve (minimum)	mm	15		
Condensate discharge pipework (minimum)	mm	19		
Flue gas spigot	mm	60/100 (concentric), optional 80/125 (concentric)		
Gas connection pressure (gas inlet working pressure) natural gas, G20	kPa/mbar	0.20/20		
Gas connection pressure (gas inlet working pressure) propane, G31	kPa/mbar	0.37/37		
Gas flow rate at 15 °C and 1013 mbar (based on hot water generation if applicable) G20 G31	m^3/h kg/h	2.6 1.924	3.3 2.42	4.1 3.05
Flue gas mass flow min./max.	g/s	1.8/11.1	2.4/14.0	3.0/17.6
Flue gas temperature min./max.	°C	40/70		
Certificated flue gas connections		C13, C33, C43, C53, C83, C93, B53P		
NOx class		5		
NOx	mg/kWh	27.7	32.3	27.4
SEDBUK (2005)		A		
SEDBUK (2009) (G20/G31)		89.1/-	89.3/90.3	89.3/-
Boiler dimensions (H x W x D)	mm	720 x 440 x 335		720 x 440 x 369
Mounting weight approx.	kg	36	38	41
Electrical connection	V/Hz	230/50		
Built-in fuse		2 A, slow-blow		
Electrical power consumption min./max.	W	80/105	70/105	100/130
Electrical power consumption at 30% partial load	W	45	50	50
Standby electrical consumption	W	< 2	< 2	< 3,3
Level of protection		IP X4 D		
Certification number		CE-0085CM0320		

17.2 Technical data for ecoTEC plus VUW boiler

18 Glossary

Air/flue gas duct
An air/flue gas duct is a line system with two separate flow channels. The flue gas is routed into separate chambers at the same time as the required combustion air is pumped to the boiler. The air/flue gas duct can be designed as a concentric or adjacent double flue gas line (the exhaust gas channel is sealed from the air channel). Floor standing boilers and gas fired wall hung boilers can be operated independent of room air through the air/flue gas duct. As a result, boilers can be installed in new buildings that do not offer sufficient combustion air for open-flued heat generators due to their airtight construction.

Burner anti-cycling time
The burner is electronically locked for a specific time after each time it is switched off ("restart interlock") to avoid frequent switching on and off of the burner (energy losses) and to extend the working life of the boiler.
The burner anti-cycling time is only activated for the heating mode.
Hot water handling is not affected if burner anti-cycling time is running.

Calorific value
Unlike the heating value, the calorific value of a fuel describes the total useable heat during combustion, based on the quantity of fuel used, including the condensation heat in the steam.
The energy contained in steam can also be used if the steam liquefies on cooling.

Compact thermal module
The compact thermal module is an assembly of Vaillant condensing units that consists of the following five main components in the ecoTEC plus: speed-regulated fan, gas valve including support plate, venturi including gas supply pipe, burner door and premix burner.

Condensing technology
Technology which maximises the use of the calorific value of the fuel. The flue gas is cooled until the water vapour that it contains condenses. The condensation heat that this releases can also be used.
In particular, the flue gas losses are greatly reduced. The losses from conduction of heat and radiation are also reduced by the lower system temperatures. The entire heating installation should therefore be designed for low system temperatures (flow/return temperature) for the effective use of the calorific value. The level of efficiency attainable for boilers is always given based on the heating value of the gas. Due to the additional condensation heat used, the calculated values can exceed 100%.

Digital information and Analysis system (DIA)
The Vaillant ecoTEC plus boiler is fitted with a digital information and analysis system (DIA). If additional settings are required, which have not been configured using the installation assistant, then you can view and modify these using the DIA.

eBUS
eBUS is an abbreviation for energyBUS. The eBUS is a special bus used in heating technology, which assists the communication between intelligent components in the heating technology. In a Vaillant system, up to eight different heat generators can be connected via the eBUS.
The eBUS communications protocol simplifies the control-related linking of different system components within a heating installation. It provides particular flexibility for retrofitting and expanding the system. This simplifies the installation of boiler cascades or the subsequent addition of components such as solar hot water generation.
The eBUS provides extended facilities for connecting controllers.

Multi-functional module
The multi-functional module is an accessory that controls additional functions or components in combination with Vaillant boilers with eBUS electronics. It also allows you to select and control 2 in 7, e. g. circulation pump, external heating pump, external solenoid valve or response from the flue non-return flap.

19 Appendix

Installation, Commissioning and Service Record

benchmark
COLLECTIVE MARK
THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING
AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

BENCHMARK LOG BOOK

Please affix the label from the rear cover of the control box over this area.

PEEL OFF

COMMISSIONING CHECKLIST GAS BOILER SYSTEM

This Commissioning Checklist is to be completed in full by the competent person who commissioned the boiler as a means of demonstrating compliance with the appropriate Building Regulations and then handed to the customer to keep for future reference.

Failure to install and commission this equipment to the manufacturer's instructions will invalidate the warranty but does not affect statutory rights.

Customer Name _____ Telephone Number _____

Address _____

Commissioned by *(print name)* _____ Engineer ID Number _____

Company Name _____ Telephone Number _____

Company Address _____

_____ Commissioning Date _____

To be completed by the customer on receipt of a Building Regulations Compliance Certificate *:

Building Regulations Notification Number *(if applicable)* _____

CONTROLS Tick the appropriate boxes

Time and Temperature Control to Heating	Room Thermostat and Programmer/Timer ☐	Programmable Room Thermostat ☐	Load/Weather Compensation ☐	Optimum Start Control ☐
Time and Temperature Control to Hot Water	Cylinder Thermostat and Programmer/Timer ☐	Combination Boiler ☐
Heating Zone Valves	Fitted ☐	Not Required ☐
Hot Water Zone Valves	Fitted ☐	Not Required ☐
Thermostatic Radiator Valves	Fitted ☐	Not Required ☐
Automatic Bypass to System	Fitted ☐	Not Required ☐
Boiler Interlock	Provided ☐

ALL SYSTEMS

The system has been flushed and cleaned in accordance with BS7593 and boiler manufacturer's instructions Yes ☐

What system cleaner was used? _____

What inhibitor was used? Quantity _____ *litres*

CENTRAL HEATING MODE Measure and Record:

Gas Rate _____ m^3/hr OR _____ ft^3/hr

Burner Operating Pressure (if applicable) _____ mbar OR Gas Inlet Pressure _____ mbar

Central Heating Flow Temperature _____ °C

Central Heating Return Temperature _____ °C

COMBINATION BOILERS ONLY

Is the installation in a hard water area (above 200ppm)? Yes ☐ No ☐

If yes, has a water scale reducer been fitted? Yes ☐ No ☐

What type of scale reducer has been fitted? _____

DOMESTIC HOT WATER MODE Measure and Record:

Gas Rate _____ m^3/hr OR _____ ft^3/hr

Burner Operating Pressure (at maximum rate) _____ mbar OR Gas Inlet Pressure (at maximum rate) _____ mbar

Cold Water Inlet Temperature _____ °C

Hot water has been checked at all outlets Yes ☐ Temperature _____ °C

Water Flow Rate _____ *l/min*

CONDENSING BOILERS ONLY

The condensate drain has been installed in accordance with the manufacturer's instructions and/or BS5546/BS6798 Yes ☐

ALL INSTALLATIONS

If required by the manufacturer, record the following CO_2 _____ % OR CO _____ *ppm* OR CO/CO_2 Ratio _____

The heating and hot water system complies with the appropriate Building Regulations Yes ☐

The boiler and associated products have been installed and commissioned in accordance with the manufacturer's instructions Yes ☐

The operation of the boiler and system controls have been demonstrated to and understood by the customer Yes ☐

The manufacturer's literature, including Benchmark Checklist and Service Record, has been explained and left with the customer Yes ☐

Commissioning Engineer's Signature _____

Customer's Signature _____

(To confirm satisfactory demonstration and receipt of manufacturer's literature)

*All installations in England and Wales must be notified to Local Authority Building Control (LABC) either directly or through a Competent Persons Scheme. A Building Regulations Compliance Certificate will then be issued to the customer.

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benchmark COLLECTIVE MARK

THE MARK OF QUALITY FOR THE INSTALLATION, COMMISSIONING AND SERVICING OF DOMESTIC HEATING AND HOT WATER SYSTEMS

www.centralheating.co.uk

SERVICE INTERVAL RECORD

It is recommended that your heating system is serviced regularly
and that you complete the appropriate Service Interval Record Below .

Service Provider. Before completing the appropriate Service Interval Record below, please ensure you have carried out the service as described in the boiler manufacturer's instructions. Always use the manufacturer's specified spare part when replacing all controls.

SERVICE 1 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 2 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 3 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 4 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 5 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 6 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 7 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 8 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 9 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

SERVICE 10 Date

Energy Efficiency Checklist completed? Yes ☐ No ☐

Engineer Name

Company Name

Telephone Number

Engineer ID Number

Comments

Signature

21 EC declaration of conformity

EC declaration of conformity

Name and Address of the manufacturer:	**Vaillant Group UK Ltd. Belper** **Nottingham Road** **DE56 1JT Belper Derbyshire** **United Kingdom**
Identification of product:	**Gas fired wall hung high efficiency condensing boiler**
Appliance type:	**VU GB 126/5-5, ...156/5-5, ...186/5-5, ...246/5-5, ...306/5-5, ...376/5-5** **VUW / VUI GB 246/5-5, ...316/5-5, ...376/5-5** **VUW GB 246/5-3, ...286/5-3**

The appliance types satisfy the essential requirements of the relevant directives and Standards:

2009/142/EEC including amendments
"Directive on the approximation of the law of the member states relating to appliances burning gaseous fuels"

92/42/EEC including amendments
"Directive of efficiency relating to boiler burning gaseous fuels"

2006/95/EEC including amendments
"Directive on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits"

2004/108/EEC including amendments
"Directive on the approximation of the law of the member states relating to electromagnetic compatibility "

Designed and built to CE-type examination certificate:

PIN: **CE-0085CM0320**

Designed and built according to European Standards
EN 483, EN 483/A4 E
EN 677
EN 625
EN 60335-1
EN 60335-2-102
EN 60529
EN 55014
EN 61000-3-2
EN 61000-3-3

Any change to the appliance and/or any use not according to the instructions will lead to the invalidation of this Declaration of Conformity

Remscheid 07.02.2012
(Place, date)

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Vaillant 01520112

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